The Cambridge Companion to
EARLY GREEK PHILOSOPHY

EDITED BY

A. A. LONG

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PREFACE

This book seeks to provide a fresh and wide-ranging survey of early Greek philosophy, covering the thinkers often called Presocratics. Chapters are divided between studies of individual thinkers or movements, including the sophists, and studies of topics to which they collectively contributed. No knowledge of Greek is assumed, and the book includes extensive translations of primary texts, which are the authors' own, unless otherwise indicated. There is a detailed bibliography, organized in accordance with each of the main chapters, and references in footnotes to scholarly literature and to other details are mainly designed to assist the general reader rather than to engage in fine-tuning. Abbreviations of references to ancient authors and their works are explained at the beginning. Also included at the beginning are a map, showing the philosophers' native and adopted cities, a time-line of their (usually) approximate dates, and an alphabetical survey of their lives and writings.

For those who are approaching early Greek philosophy for the first time, a few words of advice on using this book may be helpful. In Chapter 1, I offer an overview of the field that Chapters 3–16 explore in detail. Because the evidence is so fragmentary and often transmitted by second- or third-hand summaries, rather than giving the thinkers' own words, a general familiarity with the later Greek (and occasionally Roman) authors who are our sources is indispensable. Those new to the subject are therefore strongly advised to read Chapter 2, Jaap Mansfeld's study of the sources, before proceeding with any of the subsequent studies, and his chapter is the place to go for guidance on ancient references in the main text and footnotes. The rest of the book is designed to be readable in sequence, but each chapter is self-contained and makes no presuppositions about the

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order in which it should be read. Those whose first interest is in the sophists could turn immediately to Chapters 14 and 15. The topic chapters are equally approachable in any order, but readers unfamiliar with the philosophers discussed in Chapters 3–9 may prefer to read these chronologically organized studies of individuals and movements before embarking on most of the topic chapters. However, the final chapter, Glenn Most's study of "poetics," though it deals with a topic, covers ground that is highly relevant to the book as a whole; it may be read both as a conclusion and also as a complement to my introductory chapter.

The contributors to this book were given a completely free hand, within the limits of space, to present their subject as they saw fit. They were asked neither to be orthodox (as if orthodoxy could obtain in this or any other history) nor to strive for originality, but to be genuinely companionable. Nothing, of course, can substitute for any serious student's unmediated encounter with the primary texts, but this book, we hope, will guide its users to issues of central interest without either over-simplification or a barrage of scholarly clutter. We shall be pleased if our readers find many of the ideas presented here difficult: early Greek philosophy would not be studied so intensively if it were easy, and the more one studies it the harder it gets. We shall be disappointed if our expositions are found difficult, and if excitement at the material does not grow in proportion to the difficulties experienced in thinking about it. If you find yourself debating with Heraclitus or Parmenides or Zeno, or with what our authors say about these and other matters, that is just as it should be. There will never be a final or even a wholly comprehensive interpretation of early Greek philosophy, and within this book (as I have sometimes indicated) different assessments of many major issues can be found. It is always possible to approach the material from fresh perspectives, and from time to time what we thought we knew is jolted by remarkable discoveries, such as the Derveni papyrus and most recently by a papyrus containing new lines of Empedocles.[1]

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[1] For the Derveni papyrus, see Most in this volume p. 341, and Laks and Most [537]. Publication of the new Empedocles material by Martin and Primavesi [380] is imminent.

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Fresh scholarly work on early Greek philosophy is constantly appearing.[2] The bibliography of this book, large though it is, has had to be quite selective, and it includes items that are too recent to have been thoroughly assessed and assimilated. These include Peter Kingsley's challenging work on Empedocles and the Pythagorean tradition [105], which advances very new ideas connecting early Greek philosophy to magic, and traces their transmission into Egypt, Islam, and medieval mysticism and alchemy. While this *Companion* was in its final stages, Patricia Curd's substantial book, *The Legacy of Parmenides* [290], appeared, and also a further book by Kingsley, *In the Dark Places of Wisdom* (Inverness, California, 1999), which reinterprets Parmenides in the light of inscriptions discovered at Velia in southern Italy.[3] Studies such as these encourage us to expect that early Greek philosophy will be as effective at stimulating thought and reinterpretation in the next century as it has been during the past hundred years.

This book has been longer in the making than I anticipated when I accepted the invitation from Terry Moore, the series editor for Cambridge University Press, to be its editor. To him and to all my contributors I offer thanks for their patience and admirable cooperation. I am especially grateful to Keimpe Algra, the author of Chapter 3, who undertook this work at short notice after an earlier contributor was unable to proceed. The modern study of early Greek philosophy has long been an attractively international undertaking. I am particularly pleased that the book's authors comprise five nationalities and are affiliated with universities from six countries.

Throughout the editorial process, I have been ably assisted by James Ker, graduate student in Classics at Berkeley. He has been an invaluable help to me in drafting the bibliography and other supporting material, in formatting the chapters, and in chasing up references. Apart from all this, I have benefited from his enthusiasm, his fertile suggestions, and his readiness to put himself in the position of someone using the book. I am also very grateful to Andrew Wilson of TechBooks, Fairfax, Virginia for his careful and courteous management of the typographical process.

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[2] For a helpful survey of recent scholarly trends, see Mourelatos [155] xxi–xxvii.

[3] For details of these inscriptions, see Coxon [270] 39–40.

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My own study of early Greek philosophy began at University College London under David Furley's splendid guidance. Looking back at that time forty years later, I see that Heraclitus, Parmenides and the other early Greek philosophers were the main reason I fell in love with ancient philosophy and with philosophy in general. This book will achieve its purpose if it encourages others to experience such an attraction.

A. A. Long
Berkeley, January 1999

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SOURCE ABBREVIATIONS

Fragments are cited from the collection of Diels/Kranz [1]; for example, "DK 28 B6.4-7" refers to lines 4–7 of fragment B6 of Parmenides, whose author-number in DK is 28. (On the A-/B-distinction, see Mansfeld pp. 24–5.)

For modern works cited with a number in square brackets (e.g., "Barnes [14]"), a full reference is given in the Bibliography. A list of journal abbreviations is provided on p. 364.

Adv. Col.	Plutarch, *Against Colotes (Adversus Colotem)*
Anc. med.	[Hippocrates], *On ancient medicine*
APo	Aristotle, *Posterior Analytics*
Ap.	Plato, *Apology*
Cat.	Aristotle, *Categories*
Crat.	Plato, *Cratylus*
De an.	Aristotle, *On the soul (De anima)*
DK	Diels/Kranz, *Die Fragmente der Vorsokratiker* [1]
D.L.	Diogenes Laertius
FHSG	Fortenbaugh/Huby/Sharples/ Gutas, *Theophrastus of Eresus. Sources for his Life, Writings, Thought and Influence* [37]
GA	Aristotle, *Generation of animals*
GC	Aristotle, *On coming to be and passing away (De generatione et corruptione)*
Gorg.	Plato, *Gorgias*
Il.	Homer, *Iliad*

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In phys., In Parm. etc.	*Commentary on Aristotle's Physics, Commentary on Plato's Parmenides,* etc.
KRS	Kirk/Raven/Schofield, *The Presocratic Philosophers* [4]
LSJ	Liddell, H. G., and Scott, R. *A Greek-English Lexicon*, rev. H. S. Jones, 9th ed. with suppl. (Oxford, 1968)
M.	Sextus Emprícus, *Against the professors (Adversus mathematicos)*
Metaph.	Aristotle, *Metaphysics*; Theophrastus, *Metaphysics*
Meteor.	Aristotle, *Meteorology*
Mem.	Xenophon, *Memorabilia*
MXG	[Aristotle], *On Melissus, Xenophanes, Gorgias*
Nat. hom.	[Hippocrates], *On the nature of man (De natura hominis)*
NE	Aristotle, *Nicomachean ethics*
Od.	Homer, *Odyssey*
Parm.	Plato, *Parmenides*
PH	Sextus Empiricus, *Outlines of Pyrrhonism (Pyrrhoneae hypotyposes)*
Phys.	Aristotle, *Physics*; Eudemus, *Physics*
Prot.	Plato, *Protagoras*
Ref.	Hippolytus, *Refutation of all heresies*
Rep.	Plato, *Republic*
Rhet.	Aristotle, *Rhetoric*
SE	Aristotle, *Sophistical refutations (Sophistici elenchi)*
Sens.	Theophrastus, *On the senses (De sensibus)*
Soph.	Plato, *Sophist*
Theog.	Hesiod, *Theogony*
Tht.	Plato, *Theaetetus*
VS	Philostratus, *Lives of the sophists (Vitae sophistarum)*

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LIVES AND WRITINGS OF THE EARLY GREEK PHILOSOPHERS

ANAXAGORAS

Born c. 500 B.C. at Clazomenae on the Ionian coast; author of a cosmology that rejects any ultimate elements and has Nous (mind) as its activating principle. Anaxagoras was the first philosopher to settle at Athens, where he spent some twenty years (under the patronage of Pericles) until his prosecution or persecution for impiety. He then left Athens probably for Lampsacus, and died c. 428 B.C. For a recent reconstruction of his career, see Mansfeld [395].

Sources

D.L. II.6-15; the Suda; Plato, *Ap.* 26d, *Phaedrus* 270a; Plutarch, *Pericles* 6, 16, 32; others in DK 59 A.

Works

A "single treatise" (D. L. I.16) known later as *Physics* and extending over two books. Sixteen passages from its "first book" (including the opening words "All things were together") are quoted by Simplicius, and all but one passage appears in his commentary on Aristotle's *Physics*; other writers preserve a few further lines. Other books attributed to him on squaring the circle, on scene painting and perspective, and on problems (DK 59 A38-40) were almost certainly spurious.

ANAXIMANDER

Born c. 610 B.C. in Miletus; the earliest thinker for whom a detailed cosmology is attested. Anaximander is credited with inventing the

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gnomon, with establishing the first Greek sundial at Sparta, with being the first to draw a map of the known world, and with constructing an astronomical model of the heavens. Died c. 546 B.C.

Sources
D. L. II.1-2; the Suda; others in DK 12 A.

Works
Anaximander was one of the first Greeks to compose a book in prose. In it, in addition to discussing cosmogony and cosmology, he speculated on the origins of human life. The Suda lists as his works: *On nature, Description of the earth, The fixed stars, Sphere,* and "a few more." These specifications, though appropriate to his known studies, are probably anachronistic descriptions of an originally untitled treatise. For the one complete sentence that survives of this, see Algra in this volume, p. 56.

ANAXIMENES

Born in Miletus; younger contemporary of Anaximander, and continuator of Milesian cosmology; fl. c. 546-526 B.C.

Sources
D. L. II.3; the Suda; others in DK 13 A.

Works
Diogenes Laertius remarks that Anaximenes wrote in "a simple and economical style" (II.3). For examples of his vivid phraseology, see Most in this volume, p. 351.

ANTIPHON

Athenian sophist of the fifth century B.C., who distinguished between natural justice and legal/conventional justice; probably identical (as proposed in this volume, see Caizzi, p. 329 n.9) with Antiphon of Rhamnus, the Attic orator (c. 480–411 B.C.) who helped to plan the oligarchic revolution of 411 and was subsequently put to death.

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Sources
(1) For Antiphon, under the identity "sophist": Xenophon, *Mem.* I.6.1-5, 10-15; others in DK 87 A; (2) For him under the identity "orator": Thucydides VIII.68, Philostratus, *VS* I.15.

Works
For Antiphon (1): *On truth* (partially extant, see Caizzi in this volume, ch. 15), and the following lost works: *On concord, Politicus, On the interpretation of dreams*. There is also evidence of his interest in mathematics and astronomy, see DK 87 B13. From Antiphon (2) various speeches survive, including a set of *Tetralogies,* which are rhetorical exercises for the prosecution and defence of a model case (see Vegetti in this volume, p. 275).

DEMOCRITUS

Born c. 460 B.C. at Abdera in Thrace; follower of Leucippus, and the principal author of the atomistic theory. Democritus was certainly familiar with Eleatic philosophy and possibly acquainted with Anaxagoras. He travelled widely, probably to Egypt and perhaps as far as India, and was known in the Roman world as "the laughing philosopher." Date of death unknown.

Sources
D.L. IX. 34-49 (includes a catalogue of writings); the Suda; others in DK 68 A.

Works
More than sixty titles are attested in D.L. IX. 46-48, mostly arranged under the following headings (classification attributed to Thrasyllus, librarian at Alexandria early 1st century A.D.): ethical, physical, mathematical, musical (including poetry), and technical. A representative sample of titles: *On good humour, On the planets, On colours, Causes concerning sounds, On irrational lines and solids, On poetry,* and *On painting*. No book survives. Most of the attested fragments are ethical maxims, preserved in the anthology of Stobaeus, who records some 130 under Democritus' name. A further 86 short aphorisms are listed in two MSS of Stobaeus as *The golden sayings of Democrates the philosopher*. Transmission of these is

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independent of Stobaeus himself (see DK vol. 2, 154), and it has been widely assumed that Democrates is really Democritus. Plato never mentions him by name. Our best source for his atomism is Aristotle.

DIOGENES

Born at the Milesian colony Apollonia on the Black Sea, c. 460 B.C., Diogenes spent time at Athens, where he was mocked by Aristophanes in his comedy *Clouds* for making divine air the world's first and only principle. Diogenes is important both for his return to a single principle, and also for treating it as intelligent and purposeful, probably under the influence of Anaxagoras' *Nous*. His researches included human physiology and cognition. Date of death unknown.

Sources

D. L. IX. 57; Theophrastus, *Sens*. 39–45; and others in DK 64 A.

Works

A treatise *On nature*, of which some ten fragments survive, most of them cited by Simplicius from his commentary on Aristotle's *Physics*.

EMPEDOCLES

Born c. 492 B.C. at Acragas, Sicily, into a prominent family; pioneered the immensely influential theory of four primary elements – earth, air, fire, water; probably associated with local Pythagoreans, whose religious and ethical doctrines, together with the arguments of Parmenides, decisively influenced him. Empedocles supported the transition from tyranny to democracy at Acragas. He soon became a legendary figure, credited with wonder-working and with ending his life by leaping into the crater of Etna. The anecdotal tradition must be partly based upon the more bizarre statements he makes about himself in his poetry (see Most in this volume, p. 355), but he clearly was a charismatic figure, and the tradition of his being a physician and an accomplished orator may be genuine. His verses were

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translated into Latin, and served as a model for Lucretius' great didactic poem, *De rerum natura*. Empedocles died c. 432 B.C.

Sources
DK 31 B112-14; D.L. VIII.51-77; the Suda; Aristotle, *Metaph.* I.3 984a11; others in DK 31A.

Works
Empedocles composed didactic poetry in hexameters, said to run to 5,000 lines (D.L. VIII.77) and to be divided between a work *On nature* and another entitled *Purifications* (Katharmoi). Most of the surviving verses (roughly 1,000 lines) are generally assigned to the first of these, but some scholars (see Osborne [364] and Inwood [357]) think that he wrote only one poem known by both titles. This issue may be clarified by the recent find of a papyrus containing previously unknown lines (see Martin and Primavesi [380]). Empedocles is also said to have written a short poem on medicine, an *Expedition of Xerxes*, epigrams, and tragedies.

GORGIAS

Born c. 480 B.C. at Leontini in Sicily and widely reputed to have become a centenarian; a celebrated sophist, especially as teacher of rhetoric. Gorgias visited Athens in 427 as an ambassador. His literary style, favouring symmetrically balanced and often rhyming phrases, was exceptionally innovative and influential.

Sources
Gorgias is the named subject of a major dialogue by Plato. Other sources: Philostratus, *VS* I.1, I.9.1-6; the Suda; Diodorus Siculus XII.53.1-5; others in DK 82 A.

Works
Two speeches survive in their entirety – the *Encomium of Helen* and the *Defence of Palamedes* – as well as a fragment of his *Funeral speech*. Summaries of his philosophical treatise *On not being* are preserved in the pseudo-Aristotelian *On Melissus, Xenophanes, Gorgias* and by Sextus Empiricus *M.* 7.65ff. (= B3).

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HERACLITUS

His birth at Ephesus is generally dated to about 540 B.C., making him a generation older than Parmenides. Though this is probably correct, it is far from certain. More than one scholar (see Hölscher [153] 161) has made them contemporaries, seeing Heraclitus responding to Parmenides rather than the other way round, as is generally supposed. His notoriously obscure philosophy was popularly summed up in the formulation: "All things flow." Most of the biographical information about his misanthropic character and arrogance has been derived from his own statements. However, the tradition that he surrendered his right to hereditary kingship to his brother (D.L. IX.6) is credible. He probably died in the period 480–470 B.C.

Sources
DL IX. 1-17; the Suda; Strabo XIV 632-3, 642; others in DK 22A.

Works
More than 100 short apothegms are quoted, particularly by writers of the Christian era. Some of these are inauthentic, and the exact Heraclitean content of others is often difficult to determine. Under the authority of Stoics, whose philosophy he strongly influenced, Heraclitus acquired the status of sage in later antiquity, and numerous imitations of his cryptic statements were composed (see Mondolfo and Tarán [235]). From Aristotle onward, (*Rhetoric* III.5 1407b13) reference is made to Heraclitus "writings" or "book," which he is said to have deposited in the temple of Artemis at Ephesus (D.L. IX.5). There is no reason to think (as has been suggested by Kirk [233]) that he was a purely oral composer, but the form of his writings appears to have been deliberately epigrammatic, cryptic, and without the connectives of normal prose.

HIPPIAS

Born in the first half of the 5th century B.C., at Elis in the Peloponnese, Hippias, the most versatile of all the sophists, was renowned for his mnemonic ability. He was a "universal man," who did original

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research in mathematics, astronomy, grammar, music, and history and composed in various poetic forms. He was also the earliest figure to have collected and classified the opinions of earlier writers, thus pioneering the doxographical tradition (see Mansfeld in this volume, p. 26). Died probably in the early years of the 4th century B.C.

Sources
Hippias is the named subject of two Platonic dialogues, neither of which gives an adequate idea of his significance. He also figures in Plato's *Protagoras*. See also Philostratus, *VS* I.11.1-8; Xenophon, *Mem.* IV.4; and others in DK 86 A.

Works
Virtually nothing of Hippias' writings survives, and even the few surviving titles do scant justice to his polymathic investigations.

LEUCIPPUS

Born in the first half of the 5th century B.C., at Miletus or Abdera, Leucippus was "the first to posit atoms as principles" (D.L. IX.30). No details of his life are known for certain, but it is assumed that he wrote later than Parmenides and probably later than Zeno, whose pupil he is alleged to have been. Date of death unknown.

Sources
D.L. IX.30-33 and others in DK 67 A.

Works
The great world-system (a treatise cited in the Democritean catalogue) was attributed to Leucippus by Theophrastus (D.L. IX.45). Another work *On mind* is cited as the source of his one surviving quotation (DK 67 B2), for which see Taylor in this volume, p. 185.

MELISSUS

Born in the early 5th century B.C. at Samos; a supporter and elaborator in prose of Parmenides' philosophical poem. Statesman and

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admiral of Samos, he defeated the Athenians in a naval battle between 441–40 B.C. Date of death unknown.

Sources
D.L. IX.24; the Suda; Plutarch, *Pericles* 26-28, *Themistocles* 2.

Works
A book entitled, according to Simplicius (DK 30 A4), *On nature or on what is*. Eight passages are quoted by Simplicius, all but one in his commentary on Aristotle's *Physics*. Further evidence about Melissus is provided in the pseudo-Aristotelian treatise *On Melissus, Xenophanes, Gorgias* (DK 30 A5).

PARMENIDES

Born c. 515 B.C. at Elea in southern Italy; the originator of Eleatic philosophy, which contrasts the truths deducible about reality, including its oneness, with the deceptive multiplicity and changeability of appearances. A wealthy man of noble birth, Parmenides possibly had some association in his youth with Xenophanes and certainly with Ameinias, a Pythagorean whom he honoured by building a shrine to him. Parmenides is said to have acted as legislator for Elea (Speusippus, fr. 1) and to have visited Athens when he was about sixty-five years old (Plato, *Parm.* 127b) – but Plato's chronology is suspect: see Mansfeld [32] 64–68). Died c. 449–440 B.C.

Sources
D.L. IX.21–23; the Suda; Plato, *Parm.* 127a-c; others in Coxon [270].

Works
Hexameter poem of which 154 lines survive, the longest continuous section through a single quotation by Simplicius in his commentary on Aristotle's *Physics* (144.26). The work had three parts: a poem of 32 lines (all but the last two quoted by Sextus Empiricus, *M.* VII.111ff.); the Way of Truth (72 lines survive, perhaps nine-tenths of the original); and the Way of Seeming (44 complete lines attested, 6 in a Latin version by Caelius Aurelianus). On the argumentative relation of these parts to one another, see Sedley in this volume, pp. 123–25. Whole poem entitled *On nature* in later antiquity.

PHILOLAUS

Born c. 470 B.C., in Croton (or Tarentum) in southern Italy; the earliest Pythagorean philosopher from whom any writings survive. In Plato's *Phaedo* (63c) the Theban interlocutors Cebes and Simmias claim that Philolaus had spent time teaching in their city, so he was approximately contemporary with Socrates.

Sources
D.L. VIII.84-5, Plato *Phaedo* 61e; others in DK 44 A.

Works
A single book, of which some ten of the twenty-six attested fragments are probably genuine (DK 44 B1-6, 6a, 7, 13, 17). Much of the other material belongs to the tradition of pseudo-Pythagorean writings, composed in later antiquity (see Thesleff [199]).

PRODICUS

Born in the first half of the 5th century B.C. on the Cycladic island of Ceos; a sophist especially notable for his linguistic studies and also for his fictional "Choice of Heracles," in which the hero is asked to choose between virtue and vice, represented as two contrasting women (Xenophon, *Mem.* II.1.21-34). Prodicus derived the origin of Greek divinities, and religion in general, from early peoples' personification of things on which life depends, such as bread (Demeter) and wine (Dionysus); also credited, like Protagoras, with positing the impossibility of contradiction (see Kerferd [433] 89–90). Died probably in the early years of the 4th century B.C.

Sources
Xenophon (cited above); Plato, especially *Prot.* 337a-c, *Euthydemus* 277e; Philostratus, *VS* V.12; and others in DK 84 A.

Works
Seasons, a work of encomia (from which the excerpt on Heracles is drawn); a treatise *On the nature of man*; probably a work *On the correctness of names*, and other unattested writings.

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PROTAGORAS

Born c. 485 B.C. at Abdera; probably the first Greek to call himself a sophist, and the one whose influential career epitomises this profession; most famous for his relativism and agnosticism. On visits to Athens, Protagoras became a close friend of Pericles and was invited to draft legislation for the new Athenian colony at Thurii in Sicily. The tradition that he stood trial at Athens and was condemned for impiety is almost certainly fiction. Died c. 415 B.C.

Sources

Protagoras is the named subject of a major dialogue by Plato, and he also figures importantly in Plato's *Theaetetus*. Other sources: D.L. IX.50-56; Philostratus, *VS* I.10; Plato, *Prot.* passim; many others in DK 80 A.

Works

Diogenes Laertius gives a catalogue of Protagoras' works (IX.55), some of which are probably spurious or subdivisions of single works. His authentic treatises included *On truth,* also called *The downthrowers* (which opened with, "Man is the measure of all things"; B1), *Speeches pro and contra (Antilogiai),* and *On the gods* (which began, "Concerning the gods I can know neither that they exist, nor that they do not exist, nor what they are like in form"; B4). Approximately twelve brief fragments survive. For his contributions to literary criticism and linguistics, see D.L. IX.52-4; DK 80 A27-30.

PYTHAGORAS

Born c. 570 B.C. at Samos; migrated to Croton in southern Italy c. 530 where he is said to have "laid down a constitution for the Italian Greeks" (D.L. VIII.3) and established a sect distinguished by its ritual observances, dedication to "purity" of life, and some kind of communal living. Pythagoras was idealised as a "divine man" with wisdom gained from Egypt and further east and with supernatural powers, such as the ability to recall his previous incarnations. Subject of hagiographical biography by neo-Platonists. It is uncertain how far, if at all, he initiated the mathematical and musical studies with which Pythagoreanism came to be associated. Died c. 490 B.C.

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Sources
See Huffman in this volume, p. 67.

THALES

Born c. 624 B.C. at Miletus; first "inquirer into nature" according to Aristotle (*Metaph.* I.3 984a2) and idealised elsewhere as one of the seven sages and as a paragon, like them, of political wisdom. Herodotus praised Thales for advising the Ionian states to unite in the face of the Persian threat (I.170). He is also characterised as the one sage to have gone beyond the practical (Plutarch, *Solon* 3.5), as in the anecdote that he fell into a ditch while gazing at the heavens, reported by Plato (*Tht.* 174a-b) in a context where he is presented as the paradigm philosopher. Thales is said to have predicted a solar eclipse (probably 585 B.C.) and is credited with expertise in engineering, geometry, and astronomy, possibly acquired from travel in Egypt. Died c. 546 B.C.

Sources
D.L. I.22-44; Herodotus I.74-75, 170; others in DK 11 A.

Works
Diogenes Laetius' sources report that Thales left nothing in writing and that a *Nautical astronomy* attributed to him is spurious (I.23).

XENOPHANES

Born c. 570 B.C. at Colophon on the Ionian mainland. After the Persian conquest of Lydia in 545, Xenophanes lived an itinerant life, which included stays in Sicilian cities. By his own testimony (DK 21 B8), he was still alive at the age of ninety-two. His surviving verses treat of cosmology and theology, criticize conventional values, adumbrate cultural relativism and scepticism, and also include traditional themes of sympotic poetry. In later antiquity he was regarded as the founder of Eleatic philosophy and teacher of Parmenides, but while he almost certainly influenced Parmenides, this tradition should not be accepted completely at face value.

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Sources

DK 21 B1-3, B8; D.L. IX.18-21; Clement of Alexandria, *Stromateis* I.64; Plato, *Soph.* 242d; Aristotle, *Metaph.* I.5 986B18, and in the pseudo-Aristotelian treatise *On Melissus, Xenophanes, Gorgias* (DK 30 A5); others in DK 21 A.

Works

About 120 verses have been preserved. More than half are elegiacs, and one elegiac poem (B1) may be complete. Others, apart from one iambic trimeter (B14.1), are hexameters. Some of these are quoted from the *Silloi* (satirical verses) or *Parodies* and by late antiquity at least five books of *Silloi* were credited to him (B21a); Proclus says that they were directed "against all philosophers and poets" (DK 21A 22; cf. D.L. IX.18). The other extant lines may also come from this work, although certain fragments may belong to a poem entitled *On nature* in the Hellenistic period. Xenophanes is also said to have written 2,000 verses on the foundations of Colophon and Elea (D.L. IX.20).

ZENO

Born c. 490 B.C. at Elea in southern Italy, where he studied with Parmenides (Plato, *Parm.* 127a-b). Zeno is the author of paradoxes on the impossibility of motion and plurality. These are generally treated as a defence of Eleatic monism (but see McKirahan in this volume, p. 134). Stories of his visiting Athens, as "a very handsome forty year-old," with the elderly Parmenides and encountering the young Socrates there (Plato op. cit.) may be fiction, as the chronology of the supposed meeting must be (see Mansfeld [32] 64–68). The length of his life is impossible to determine, but his work was almost certainly familiar to Democritus and probably to Anaxagoras as well.

Sources

D.L. IX.25-29; the Suda; others in DK 29 A.

Works

Zeno may have written only one work, the "writings" he is described by Plato as reading to the young Socrates (*Parm.* 127c).

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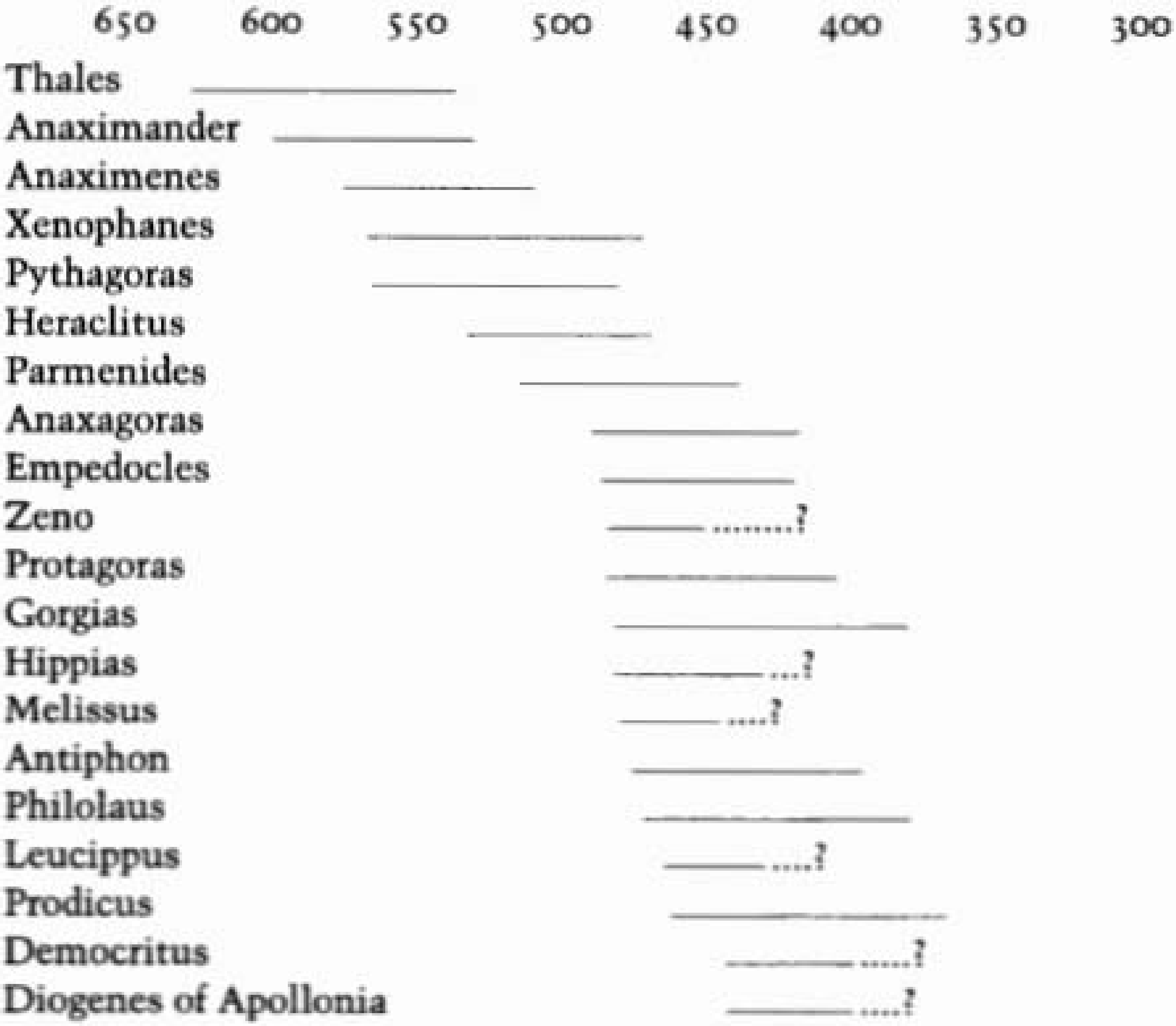
CHRONOLOGY

This list of early Greek philosophers represents roughly who was contemporary with whom, and a second list of prominent individuals mentioned in this book is appended. Most of the dates are only approximate, and could extend forward or backward by ten to twenty years. Homer is traditionally dated to the 8th century B.C., Hesiod to the 8th or early 7th.



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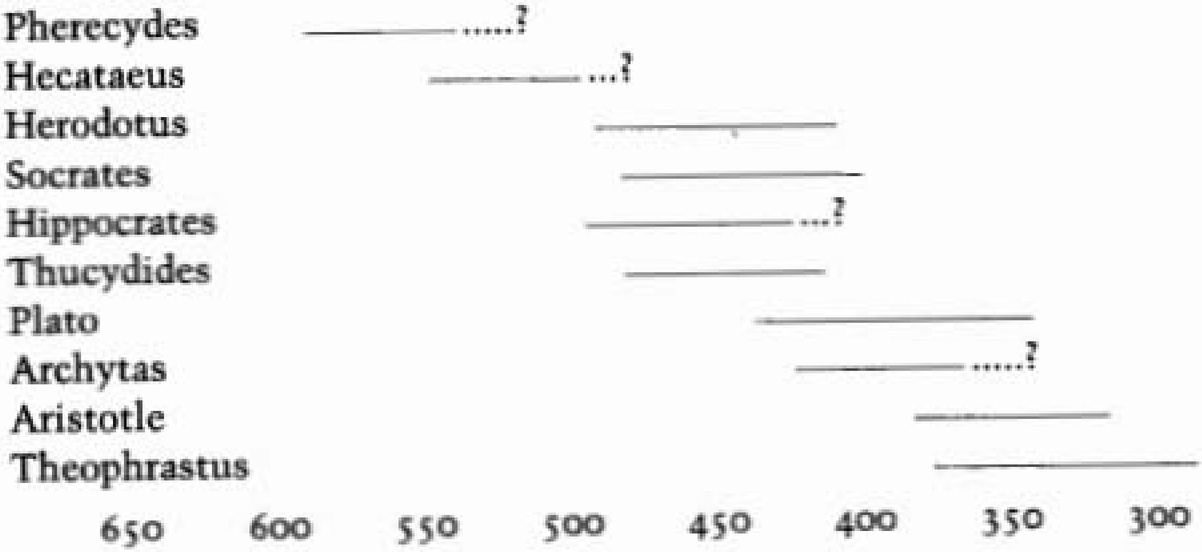
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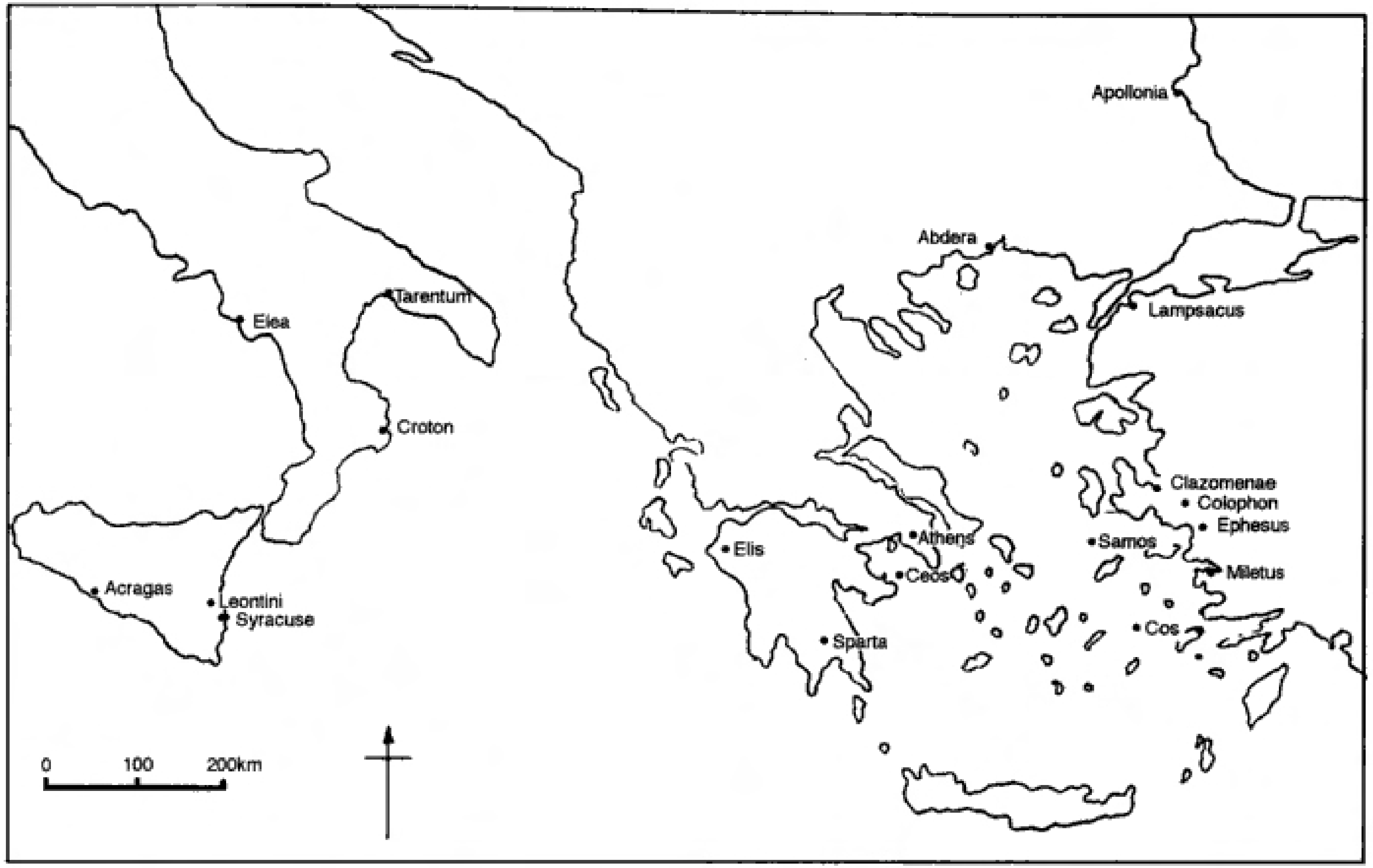
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Croton
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A. A. LONG

1 The scope of early Greek philosophy

Unlike other books in this series, the present volume is not a "companion" to a single philosopher but to the set of thinkers who collectively formed the beginnings of the philosophical tradition of ancient Greece. Most of them wrote little, and the survival of what they wrote or thought is fragmentary, often mediated not by their own words but only by the testimony of Aristotle, Theophrastus, and other much later authors. These remains are exceptionally precious not only because of their intrinsic quality but also for what they reveal concerning the earliest history of western philosophy and science. The fascination of the material, notwithstanding or even because of its density and lacunar transmission, grips everyone who encounters it.[1] Two of our century's most influential philosophers, Heidegger and Popper, have "gone back" to the earliest Greek philosophers in buttressing their own radically different methodologies and preoccupations.[2] Many of these thinkers are so challenging that the small quantity of their surviving work is no impediment to treating each of them at book length. Even so, there are reasons beyond our fragmentary sources and conventional practice for presenting these and other early Greek philosophers in a collective volume.

First, we are dealing with an era marked by thinkers who were profoundly innovatory and experimental. The younger of them did not ignore their predecessors, and within the sixth and fifth centuries B.C. (the chronology of our period) a number of distinct movements developed which are distinguishable geographically or dialectically – the early Ionian cosmologists, the Pythagoreans, the Eleatics, the atomists, and the sophists. Yet, this is not a period of schools in the literal sense of Plato's Academy or Aristotle's Lyceum, with a formal head, a curriculum, and an ongoing succession. Melissus can be called an Eleatic or follower of Parmenides, by virtue of the conclusions for which he argued, but as a Samian admiral he may have had no personal acquaintance with Parmenides, whose place of birth and presumed residence was Elea in southern Italy. Zeno of Elea, who must have known his fellow countryman Parmenides, may have followed him more literally than Melissus did, but Zeno's arguments bear directly, as Parmenides' do not, on the early history of Greek mathematics. Xenophanes, Heraclitus, Parmenides, and Empedocles all trumpet the individuality of their ideas, and explicitly or implicitly criticize other thinkers as well as ordinary people. In order to interpret the work of any early Greek philosopher, reference to the whole period is indispensable.

Secondly, even allowing for the numerous gaps in our knowledge, we can observe significant differences among the methodologies and interests of the early Greek philosophers. This is particularly evident in the case of Pythagoras, the only one of them whose name, albeit years after his death, came to stand for a determinate movement. Pythagoras taught a way of life which included purificatory practices and their supreme importance for the destiny of the human soul after death. His contributions to philosophy and science, as we today understand these, are harder to discern, especially by comparison with such figures as Zeno or Democritus or Anaxagoras. Yet, it would be a grave mistake to excise Pythagoras from the main stream of early Greek philosophy. Criticism of conventional religious rituals, such as blood sacrifice, and the promise that a true understanding of the world will transform a person's life, are emphatically stated also by Heraclitus and Empedocles. Some early Greek philosophers have little or no attested interest in psychology, epistemology, ethics, and theology; others incorporate contributions to these subsequently demarcated fields in their work.

The fluidity and diversity of early Greek philosophy are a central part of its character and importance. For that reason too, the subject is particularly apt for treatment in a multi-authored volume, not only because of the opportunity this gives for a pooling of expertise, but also as a way of articulating some of the many interpretive approaches to the style and content of early Greek philosophy. In the earlier years of this century, debates raged about its scientific or nonscientific character, its common-sense or counter-intuitive biases, its theological dimensions, and much else.[3] Those debates will never entirely disappear. The material is too complex for that, and in this field, more than in most, every interpreter is bound to project a viewpoint in order to say anything worth saying. That is not to invalidate attempts to describe what the main thinkers have in common, such as "the inquiry into nature." More on this later in the chapter. For now, it is essential to recognize that, with the possible exception of Pythagoras, none of the figures treated in this book identified himself expressly as a "philosopher" or called his project "philosophy."[4] The point is not that *we* should avoid calling them philosophers, but that we should beware of attributing to them anachronistic conceptions of the scope of philosophy and its subdivision into fields such as logic, metaphysics, and ethics. Even Plato, who was the first Greek thinker to theorise explicitly about the nature of philosophy, is innocent of this kind of demarcation.

Nevertheless, early Greek philosophers made pioneering contributions not only to the understanding of the world in general but also to philosophical topics that were later described more specifically. For ease of exposition and to facilitate a broad grasp of what early Greek philosophy comprised, this book is divided between chapters on particular thinkers and chapters on topics. In the case of the sophists (Chapters 14–15), the topics and the individual thinkers largely coincide because, so far as our record is concerned, the sophists' most distinctive contribution to early Greek philosophy was their teaching of rhetoric and linguistics, relativism and political theory. Chapters 10–13, on the other hand, are devoted to topics that are quite heterogeneous in the thinkers whose views are discussed there – chapters on rational theology; the beginnings of epistemology; soul, sensation, and thought; and responsibility and causality. The principal heroes of this last topic chapter, by Mario Vegetti, are Hippocratic doctors. It was they, he argues, rather than those we conventionally count as early Greek philosophers, who pioneered rigorous thinking about causes. His chapter also includes the historians Herodotus and Thucydides. Rather than trespassing outside the proper limits of early Greek philosophy, this material is an important indication of their instability. If space were not an issue, this book would have included much more from the rich field of Hippocratic medicine.[5]

A final topic chapter, or rather a coda to the whole book, is provided by Glenn Most in his wide-ranging study of "the poetics of early

Greek philosophy." Three of the early Greek philosophers, Xenophanes, Parmenides, and Empedocles, chose verse rather than the newer medium of prose as the vehicle for expressing their thought; Heraclitus, though he did not compose in any of the formal modes of Greek verse, adopted a rhythmical and epigrammatic style that is uniquely his own. Here we have yet another indication of the fluid character of Greek philosophy in its formative years; for from the second half of the fifth century onward, discursive prose would become the standard medium for writing philosophy, and poetic "truth" would be treated as different in kind from the probative ambitions of philosophy. However, "poetics" is an integral feature of our subject for deeper reasons than the philosopher poets' literary form. Traditional Greek wisdom was virtually identical to the epic poetry of Homer and Hesiod. As the staple of primary education, these great texts, more than any others, influenced and provoked both the style and the content of early Greek philosophy. If innovative thought was to take root, Homer and Hesiod had to be dethroned or at least shifted away from their commanding position, and so we find explicit criticism of them in Xenophanes and Heraclitus. Yet, in numerous ways, as Most so convincingly shows, Homeric and Hesiodic patterns of thought as well as expression are still palpable in early Greek philosophy, not to mention such obvious points of contact as the "divine" inspiration invoked by Parmenides and Empedocles, or the explicit interpretations of poetry essayed by Democritus, Gorgias, and Protagoras.

The topic chapters distinguish this book's account of early Greek philosophy from many standard treatments of the subject.[6] So too, to some extent, our treatment of individuals. The Milesian trio, Thales, Anaximander, and Anaximenes, are the main theme of a single study – Chapter 3. We have no chapters solely devoted to Xenophanes or to Diogenes of Apollonia, while Empedocles and Anaxagoras are discussed together in Chapter 8 from the perspective of their responses to Parmenides. Zeno is given a chapter to himself, but Parmenides and Melissus are presented in conjunction. If this procedure looks partial or idiosyncratic, the chapters on topics and the index will provide the reader with many additional perspectives on all the main thinkers. Thus Xenophanes is accorded a good many pages in Chapters 3, 10, 11, and 16. Empedocles, one of the most many-sided thinkers, figures prominently in the topic chapters and also in Chapter 4, on the Pythagorean tradition. A great advantage of this procedure, or so we believe, is its combination of diachronic history, treating of individuals, with the analysis of salient themes and methodologies to which they collectively contributed.

However, there is more than that to the book's rationale. We start, after this introduction and Chapter 2 on sources, with the beginnings of cosmology at Miletus (Chapter 3). For evidence on this subject, we are almost entirely dependent on the tradition of interpretation initiated by Aristotle and Theophrastus. Whatever we make of that tradition, there is no question that it imports some anachronism and misrepresentation.[7] In addition, it has helped to promote the view that early Greek philosophers in general were predominantly, if not exclusively, cosmologists, whose chief questions were about the origins and material principles of the world.[8] Cosmologists, indeed, most of them were if we exempt the sophists. But should the sophists be extruded from the ranks of early Greek philosophers because they did not engage, to any great extent, in cosmology?[9] Apart from the inappropriateness of answering yes to that question, identifying early Greek philosophy as predominantly cosmology has had the unfortunate effect of making its contributions to epistemology, ethics, and other topics seem ancillary and perfunctory. That misconception is no longer so entrenched, but it has hardly disappeared. Therefore, one of the aims of this book is to show how much these early thinkers contributed not only to cosmology but also to other topics that would become part of the main agenda of philosophy.

TOWARDS A DEFINITION OF EARLY GREEK PHILOSOPHY

Thus far I have refrained from calling the early Greek philosophers by the familiar term Presocratics. The word first became current in English after the German scholar Hermann Diels nearly a hundred years ago used it for the title of his great collection of evidence on early Greek philosophy, *Die Fragmente der Vorsokratiker* (*The fragments of the Presocratics*).[10] Since then, it has become standard terminology. Those who first encounter the word probably suppose that it refers simply to thinkers who were chronologically prior to Socrates, and that is broadly true for the figures in Diels' first volume, who range from the mythical Orpheus to "the Pythagorean school."

But in Diels' own usage, Presocratic is more than a chronological marker. As his younger collaborator Walther Kranz explained, the second volume of their collection includes "many contemporaries of Socrates, and indeed some who outlived him. Even so the book is a unity" because in it "a philosophy speaks which has not passed through the intellectual schools of Socrates (and Plato) – not just the Presocratic but also the non-Socratic early philosophy."[11]

This comment is less innocent of assumptions than it may seem to be. What is especially telling is that Kranz puts Plato's name in a parenthesis. In fact, of course, Plato's writings are our principal source for determining Socrates' unwritten philosophy and for distinguishing it from that of his contemporaries, including especially the sophists. Most of what we can learn about the sophists, apart from the surviving work of Gorgias, stems from Plato, and nothing mattered more to Plato than defending Socrates from the widespread belief that he was, to many intents and purposes, a sophist. Plato, then, is far from being an unbiased witness to the distinctiveness of Socrates' philosophy. Certainly, he is the best we have, and unquestionably Socrates, in his interrogative methodology, his search for definitions of moral concepts, his self-examined life, and in a great deal else was a massively original figure. However, Diels and Kranz were writing at a time when scholars supposed that they knew much more about the historical Socrates than many experts are confident of knowing today.

We can be confident that the historical Socrates was much more like his namesake in Plato's *Apology* and *Crito* than the character "Socrates," investigator of nature and sophist, who is travestied in Aristophanes' raucous comedy, *The Clouds*. I am not suggesting that Presocratic is a term that should be totally abandoned; even if that were desirable, it would not be practicable. Given the sources at our disposal and Socrates' remarkable afterlife, it would be irresponsible to treat him simply as one among other thinkers of the fifth century B.C. He must be viewed in association with Plato, and hence he is scarcely discussed in this book (but see Chapters 14–15). Still, that requirement does not license us to regard even Plato's Socrates as a figure so seminal that those he influenced were quite discontinuous with those who missed his impact.

By representing the early Greek philosophers as conceptually or methodologically Presocratic, we have tended to overlook or marginalise their interest in such topics as I have already mentioned, including ethics, psychology, theology, and epistemology. Because Plato never mentions Democritus, it is easy to forget that Democritus was Socrates' contemporary.[12] Yet, there are striking affinities between Democritus' moral psychology and ideas voiced by Plato's Socrates.[13] Writers of later antiquity, who credit Socrates with single-handedly originating philosophical ethics, were too keen on identifying "first discoverers." Far from undercutting Socrates' significance, we highlight it when we acknowledge the ethical dimensions of Xenophanes or Heraclitus, or indicate the interests he shared with, and doubtless debated with, the sophists. The Presocratic label is also misleading because of its generality. Vague though it is, it suggests that all the early Greek philosophers are easily identifiable as a group, and chiefly so by their non-Socratic features. In that way, the term conceals the fluidity and diversity I have already emphasized. Presocratic also tends to obscure Plato's dialectical relation to his other predecessors, especially the Pythagoreans, Eleatics, and Heraclitus: a relation that takes on increasing importance in Plato's later dialogues where he replaces Socrates with the Eleatic and Athenian "strangers" and with Timaeus.

Neither in antiquity nor subsequently has unanimity reigned over the scope, boundaries, and subdivisions of early Greek philosophy. Aristotle and Theophrastus, as Jaap Mansfeld explains in the next chapter, were chiefly interested in classifying the opinions of their predecessors on topics such as the number and identity of the world's principles, the soul, and sense perception. All of these fell under the Peripatetic concept of "nature," so they called the proponents of these views inquirers into nature (*physikoi* or *physiologoi*).[14] Sometimes Aristotle comments on their relative chronology, but whether he does so, or who he includes within a given context, depends on his view of their relevance to his topic. In his treatment of "causes," he makes a clear break between Plato and those who preceded him, including Parmenides and the Pythagoreans, and here (but only here) he famously emphasizes Socrates' concentration on ethics to the exclusion of any inquiry into "nature as a whole."[15] In his treatment of "principles" (*Physics* I), Aristotle discusses the early Ionian cosmologists, Heraclitus, Empedocles, Anaxagoras, Parmenides, and Melissus and briefly alludes to Plato. In book I of his work *On the soul*, his discussion of his predecessors is synchronic, independent of any attempts to define periods of thought, and treats Plato alongside earlier philosophers (as does Theophrastus in his work *On the senses*). Aristotle nowhere calls Protagoras a sophist, and after he has argued against Protagoras' "man measure" doctrine (*Metaph.* IV.5), he likens its rationale to statements by Anaxagoras, Democritus, and others.

Aristotle has an implicit concept of *early* Greek philosophy, but it is more pre-Platonic than pre-Socratic.[16] Subsequent authors of philosophical "successions" and lives, writing in Hellenistic times, tended to draw a line *under* Socrates in order to present everything that came *after* him as a series of Socratic schools specializing in ethics.[17] Yet, Socrates himself could also be presented as the last link in a succession that began with Anaximander.[18] For us these classifications are mainly of antiquarian interest, but they help to show that the boundaries of this history, though they need to be drawn, are inevitably imprecise and partly subjective.

The point is not simply methodological. It also affects what we take as the beginning of early Greek philosophy, and how we interpret its subsequent history. I say history rather than development, because the concept of development, which controls Zeller's Hegelian treatment of Greek philosophy, has also been too dominant.[19] Its biological connotations tend to prejudge the superiority of what comes later to what precedes, and while there undoubtedly are developments in the sense that Democritus' atomism is a response to and (in our modern eyes) a clear advance on all preceding theories concerning the foundations of physical reality, Heraclitus and Parmenides, for instance, deserve scrutiny and provoke thought entirely for their own sake, however we assess them in relation to subsequent philosophy.

As regards the beginning, this book follows the convention, authorized by Aristotle, of making Thales of Miletus the pioneer, and no *individual* claimant with a better title will ever be suggested. Yet Aristotle, to his credit, observes that "one could suspect" that the epic poet Hesiod has adumbrated his own idea of an "efficient cause" (*Metaph.* I.4 984b23). In certain contexts, Aristotle is quite prepared to find philosophical thoughts in figures prior to Thales. And was Thales or Anaximander the first Ionian philosopher? Diogenes Laertius, writing around A.D. 200, classifies Thales as one of the seven wise men (*sophoi*), but he also makes him the teacher of Anaximander, whom he credits with originating Ionian philosophy (I.13).

Then there is the intriguing but obscure figure of Pherecydes, the first, according to some very late reports, to teach the immortality of the soul.[20] Suspicion about this is natural when one reads that Pherecydes was the teacher of Pythagoras (D. L. ibid.), and Pherecydes too is pushed back by Diogenes into the ranks of "wise men" prior to philosophy. The question of whether to include Hesiod and Pherecydes in the history of early Greek philosophy is usually answered either negatively or by treating them as "forerunners."[21] One justification for that procedure will emphasize the difference between the *mythological* cosmogonies of Hesiod and Pherecydes and the early Ionian cosmologists' reference to observable regularities that do not depend upon the arbitrary will of divinities. The point is well taken, but it will hardly stand as a defining characteristic of early Greek philosophy in general. Neither Parmenides nor Empedocles (nor Plato, for that matter) disavows all use of mythology, and theology is an important element in the thinking of Xenophanes and Heraclitus (see Chapters 10 and 16).

If Thales or Pythagoras or Xenophanes had been isolated figures, to whom their contemporaries and the next generation made no significant and explicit responses, there would be little reason for treating them as the beginnings of philosophy as distinct from the continuation of "wisdom" already represented by the likes of Hesiod and Pherecydes. What particularly distinguishes the former group from the latter is a pair of very significant facts. First, Thales, whether or not he "taught" Anaximander, was plainly perceived as influencing the more ambitious cosmologies of his fellow Milesians, Anaximander and Anaximenes. He left some kind of intellectual legacy which could be drawn upon, improved, and criticized. Second, by around 500 B.C. Heraclitus forcefully differentiates his own thought from the "polymathy" of both Hesiod and three others – Pythagoras, Xenophanes, and Hecataeus (DK 22 B40).

This quartet of names is most revealing. Heraclitus couples the revered poet Hesiod with three recent contenders for "wisdom." To Pythagoras and Xenophanes he adds the Milesian geographer and chronicler Hecataeus. We could ask for no better evidence than this for a participant's perspective on Greek philosophy in its formative stage. Heraclitus seeks to distance himself both from ancient authorities (Hesiod) and from a *group* of near contemporary figures. We should assume that he chose this constellation quite deliberately.

Three of them stand for new, would-be authorities, representatives of an enterprise in which he too is engaged, but which he will execute far more effectively. Significantly, however, Heraclitus is so close to the beginnings of the tradition he will help to shape that he attacks Hesiod in the same sentence that pillories Xenophanes, Pythagoras, and Hecataeus.

Competition over wisdom and skill had long been endemic in Greek culture. Poets as well as athletes vied with and were expected to vie with one another. What is new in Heraclitus (and we see it also in Xenophanes) is the subject for competition. Xenophanes, according to the better construal of an ambiguous sentence, describes himself as talking about "all things" (DK 21 B34),[22] and Heraclitus, right at the beginning of his book, claims that all things happen in accordance with the account (*logos*) that he gives (DK 22 B1). Within the same context, Heraclitus describes himself as "distinguishing each thing according to its nature" (*physis*). The "inquiry into nature" is an apt description of early Greek philosophy; it was Aristotle's expression, as we have seen, and there is no doubt that some early Greek philosophers, whether or not they used the word, pioneered such connotations of nature as objectivity, the way things are, the basic structure of things, reality as distinct from appearance or convention. Still, to say all this is to jump ahead somewhat. More authentic for grasping what Xenophanes and Heraclitus took themselves to be undertaking may be the formulation, "giving an account of *all things*."

GIVING AN ACCOUNT OF ALL THINGS

We should take this expression in a quasi-technical way. The project is not to talk about or explain literally everything, but rather to give a universalist account, to show what the "all" or the universe is like, to take everything – the world as a whole – as the subject of inquiry.[23] We can now see why Heraclitus chose the four members of his dismissed quartet: Xenophanes probably professed a discussion of all things; Hecataeus of Miletus had made a map of the earth, and he also wrote a work tracing families back to their mythological origins; Hesiod's *Theogony* is universalist in its aim to include the main features of the visible world and also numerous "abstract" things such as love, strife, friendship, and deceit, within the scheme of divine progenitors and their offspring. As for Pythagoras, even if he did not initiate the mathematics and the musical models of the world, associated with his name, we can presume he was widely regarded as the author of a quite general account of things, especially how human beings, by virtue of their souls, are situated.

It is significant that Heraclitus does not include Thales, Anaximander, or Anaximenes in his hit-list. If his point had been simply to attack all other universalists, these Milesian cosmologists could have been prime candidates. What saved them from from criticism here, we may guess, is the *focus* of their accounts on the world's underlying unity, the proposition that Heraclitus himself proclaims to be the essence of wisdom – "All things are one" (DK 22 B50). Hesiod and the younger trio, by contrast, are taken to have obscured this central truth by contaminating their universalist pretensions with a multiplicity of data (polymathy).[24]

By viewing early Greek philosophy as a project of accounting for and systematizing all things, we get a formulation that incorporates the main figures discussed in this book, and that does justice to their fluidity and variety without collapsing into vagueness. The term "nature" (*physis*), in spite of its generality, inclines us to regard something more restrictive, the physical world and in particular its beginning (because *physis* primarily means "origin" or "growth"), as their single focus. This works pretty well in the case of the Milesian cosmologists, for whom our patchy evidence is largely filtered via the Aristotelian tradition. It is less effective for delineating the early Greek philosophers whose own words we are in a position to read, especially if it inclines us to to see them as detached observers and theorists of nature, who do not include the mind and human subject within the scope of their inquiries.[25] Yet, right at the beginning of our period at Miletus, we find Anaximander investigating the origin of living beings and the "evolution" of humans.[26] In the next generation, Anaximenes used the human soul as a microcosmic model for the way "divine" air encompasses the world.[27] Even at Miletus, then, "cosmology" was broadly conceived. When we come to thinkers who are better attested, their universalism and interest in human experience are strikingly evident. This book documents numerous familiar instances, but others, less well known, are highly relevant here.

Anaxagoras studied Homer's ethical content, and his cosmology was used as the basis for giving an allegorical account of the *Iliad*.[28]

Democritus, of whose voluminous writings we possess pathetically little, anticipates Aristotle in the vast scope of his interests. They included ethics (see Chapter 9), mathematics, music, anthropology, and literary theory, especially on Homer. Both Gorgias and Hippias, according to Plato, were prepared to talk on any subject, and Plato describes Hippias' claim to teach astronomy, mathematics, and philology, to the last of which both Prodicus and Protagoras made salient contributions.[29] As a defining mark of early Greek philosophy's scope, "accounting for *all things*" can accommodate the so-called sophists within the tradition. Doubtless Gorgias and Protagoras had nothing to say about objective nature, but that can be explained by their sceptical or relativistic views on truth (see Chapter 14). They certainly were prepared to talk about "all (the) things" they deemed relevant to human utility and understanding, as befits Protagoras' famous slogan: "Man is the measure of *all* things."

This is not to say that little has changed between the interests and methods of the earliest of the early Greek philosophers and those of the latest. Nor is it to question the sophists' innovativeness in their role as paid educators. By the later years of the fifth century, "wisdom" (*sophia*), the common denominator of the words philosophy and sophist, has acquired a more "professional" connotation than it had at the time of Thales – a connotation of acknowledged expertise in understanding and teaching the *general* conditions of the world and human experience. This cultural development would not have been possible without the startlingly bold presumption, evident from the Milesians onward, that attempts to *account for* all things, as distinct from relying on trust and tradition, are humanly possible and desirable. Even Aristophanes supports this interpretation of the scope of early Greek philosophy; for while we may choose to call his parodic Socrates a combination of "natural" scientist and sophist, the character in the comedy itself is a unity.

To sum up. From about 550–500 B.C. in Ionia – at Miletus (the city of Thales, Anaximander, and Anaximenes), Samos (the birthplace of Pythagoras), Colophon (Xenophanes' native city), and Ephesus (the home of Heraclitus) – what *will* become a quite new intellectual tradition is in the making. The persons in question are highly individualistic. Pythagoras migrates to Croton in southern Italy, and forms a religious community there; Xenophanes includes Italian cities in his travels, and composes in various verse forms; Anaximander writes a book in the new medium of prose; and Heraclitus expresses himself in highly obscure and epigrammatic sentences. There is no conformity, as yet, about what it is to philosophize, no conception of philosophy as such. However, the youngest of these figures, Heraclitus, is already insistent that he has an account of "all things" that is uniquely correct and vastly better than what the others have to offer.

Long before, Hesiod had presented his *Theogony* in a poetic competition, and he too could have called it an account, or at least a story, about "all things." What is it, apart from Heraclitus' distance from traditional mythology and epic discursiveness, that sets him radically apart from Hesiod? Among many points that could be adduced, five are of prime importance. First, Heraclitus is quite explicit about the kind of account he intends to give: it is to be an account that "explains" and "distinguishes" each thing. Trading on the multiple meanings of the word *logos* (discourse, account, reckoning, measure), he comes as close as the current resources of his language allow, to saying that he will give a "rational" and systematic account of all things. Second, his pronouncements, in spite of their obscurity, show his concern to make his account coherent with our cognitive faculties, both empirically and conceptually. He makes it possible to conduct an argument with him. Third, he formulates this account in a way calculated to "awaken" people from their individual delusions about how all things happen. He has a transformative, one might almost say "salvational," objective. Fourth, he intends not only to tell truths but also to tell them in such a way that those who listen will be required to think and investigate for themselves. He is a teacher who wishes to provoke the minds of his audience. Fifth, as Xenophanes had already done, Heraclitus sets himself apart from merely ethnocentric conventions and received wisdom, but he also adopts a critical distance from Xenophanes and everyone else.

Giving an account of all things that is (1) explanatory and systematic, (2) coherent and argumentative, (3) transformative, (4) educationally provocative, and (5) critical and unconventional – with such a formulation we can encompass the general project of early Greek philosophy without anachronism and with respect for its diversities of emphasis, method, and specific content. Like any generalization, it is too broad to incorporate every particularity; this book, for instance, scarcely deals with the meteorological speculations of some early Greek thinkers. Still, the generalization is apt for those thinkers whose own words are well attested, especially Xenophanes, Heraclitus, Parmenides, and Empedocles; it fits what we know of Democritus, and to quite an extent, it also fits the sophists. There is nothing original about my first, second, and fifth features, but the third and fourth require some amplification.

Karl Popper wrote of the Presocratics' "simple straightforward *rationality*."[30] His enthusiasm for these thinkers is beguiling, but they actually become far more interesting when we acknowledge that their rationality was neither simple nor straightforward. A prominent French scholar has recently proposed that the entire Graeco-Roman tradition of philosophy should be construed, first and foremost, as practical and "spiritual" in its goals, advocating philosophy as a way of life.[31] This characterization will strike many people as appropriate only to *some* later ancient philosophies, but it has the great merit of asking us not to impute modernist conceptions of philosophy's complete disinterestedness or "pure" inquiry to classical antiquity. Notice, for instance, how Euripides, a tragedian deeply versed in the intellectual ferment of his era, makes the chorus in one of his lost plays comment on the blessings of "inquiry":[32]

Blessed is he who has learned how to engage in inquiry,
with no impulse to harm his countrymen or to pursue
wrongful actions, but perceives the order of immortal and ageless
nature, how it is structured.

In these lines we hear early Greek philosophy praised in contemporary words that capture its holistic ambition, scientific, speculative, ethical, and awe-inspiring.

The leading figures clearly take falsehood to be grievously damaging to those in error, hence the strident tones with which Xenophanes, Heraclitus, Parmenides, and Empedocles berate their unenlightened audience. Not only Pythagoras but also these thinkers have objectives that can be called transformative, and much of Plato's animus against Protagoras stems from his belief that the latter's claims to be able to teach good management of one's own and one's city's affairs cannot stand their ground against Socratic scrutiny. Plato did not invent the notion that a true account of all things will have a beneficial effect on the lives of those willing to attend to it; he inherited this idea from his philosophical predecessors.

Directly related to this is the feature of being educationally provocative. That hallmark of Socrates can also be traced further back. Although Plato persuades us to draw a radical distinction between Socratic discourse and the rhetoric of sophists, Plato's Socrates, like Plato himself, is also a master rhetorician, as any effective educator must be. Truth, in order to be recognized, needs persuasive expression, but if people are also to be encouraged to discover truths for themselves, they need precisely the provocation in which Heraclitus and Parmenides engaged and which Protagoras as well as Socrates probably engaged in too.

These points reinforce the misdirections that the Presocratic label can induce. To quite a large extent, Plato's Socrates fits the characterization of early Greek philosophy I have offered, and Plato himself fits it even better.[33] In his earliest writings, Plato primarily focused on the ethical questions and methodology he took to be Socrates' distinctive legacy, but as his thinking developed, he concentrated increasingly on Heraclitus, Protagoras, the Pythagoreans, and the Eleatics, outlining his own cosmology only in the *Timaeus*, one of his latest works. Like Aristotle, we should sometimes draw a line before Socrates or before Plato, but for some purposes we need to extend the earliest phase to include even Plato himself.

CONCLUSION

With these modifications my version of the salient features of early Greek philosophy is largely in line with current views, whether these emphasize the reform of theology, the capacity for abstract generalization, totalizing explanations, counter-intuitive hypotheses driven by argument, or commitment to critical inquiry. Some of the thinkers incline more to science and to findings broadly reliant on observation. Others call the appearances of things into question, and adumbrate thoughts that will much later be grist to the sceptics' mill. With Parmenides and his fellow Eleatics, we can observe logic and metaphysics in the making. We find cosmological models that are breathtaking in their boldness, incipient ideas of an evolving and self-regulating universe, systematic in its structure and basic ingredients. Distinctions are drawn between nature and convention, setting the stage for investigation into the foundations of language, social practices, and justice. Truth is objectified by some and relativized by others. Throughout the period discussed in this book a sense of intellectual excitement and challenge is palpable. One theory succeeds and competes with another. The accounts of "all things" have little basis in measurement or the rigorous checks and controls we associate with physics. Yet, as the period advances, culminating in Democritean atomism, one scientific theory of astonishing prescience is formulated – the theory that nature's basic structure is nothing more than matter in motion.

Why all this happened when and where it did is a question both fascinating to raise and impossible to answer with any degree of precision. Numerous factors can be adduced, among which some of the most telling (in no order of priority) are political freedom and opportunity for debate, interstate trade and communication with the older civilizations of Egypt and Asia, the rise of literacy, codification of laws, dissatisfaction with anthropomorphic myths, the prizing of innovation and self-assertion, a general interest in verbal dexterity, skill that can withstand competition, a perceived need for higher education, anxieties about the nature of human identity and its place both in the world and after death.[34] All this is relevant to our understanding of the cultural context and content of early Greek philosophy; but whatever we say about that, we should not let our proper wonder at it lapse into talk about the Greeks' peculiar genius. This book does not attempt to make any comparisons between early Greek intellectual life and that of neighbouring cultures, but that is due entirely to exigency of space and the need to impose manageable limits on any history.

The Greeks themselves acknowledged their newness relative to the much older civilizations of Egypt and Asia, and the indebtedness of their early mathematics and astronomy to Egypt and Babylon.[35] It is virtually certain that Thales and his fellow Ionians knew and were influenced by near-eastern accounts of the world's origin. For the purposes of this book, the important questions are not, who said something like this first or where did X get this idea from, but what Heraclitus and the rest did with their own thoughts (however those thoughts arose), and in what context they situated themselves and their audience. Globally speaking, the Greeks were not the only ancient people to start philosophizing.[36] The importance of their start is twofold – its position at the beginning of the

European tradition of philosophy, and the kind of philosophy that it initiated.

People often use the word "tradition" rather loosely, to signify a long-standing set of practices whose historical phases are successively connected rather than cumulative and symbiotic. From its earliest Greek beginnings, the tradition in western philosophy has been of the latter kind, with new questions, conjectures, and refutations continuously feeding off, revisiting, and revising earlier theories and methodologies. If there is progress in philosophy, it largely proceeds by such dialectical encounters with the tradition, whether or not the current participants acknowledge that relationship. It is also part and parcel of good philosophy to treat its earlier contributors as partners whom we can engage in fruitful conversation, especially when we allow for the historical contingencies that distance them from us and help to shape their outlook. If such conversations elide history and context, they tend to become polemical, artificial, and myopic, a failing that I hope this book has completely avoided. Contextualising early Greek philosophy, in the ways our contributors try to do, was not a Graeco-Roman practice, but enlisting past philosophers in present inquiries has a pedigree that is an essential part of the Greek tradition. It was beautifully expressed by Aristotle, when he wrote:[37]

> The investigation of the truth is in one way hard, in another easy. An indication of this is found in the fact that no one is able to attain the truth adequately, while, on the other hand, no one fails entirely, but everyone says something true about the nature of things, and while individually they contribute little or nothing to the truth, by the union of all a considerable amount is amassed.

Early Greek philosophy was both the beginning of the ancient tradition and also an integral part of its subsequent phases. Plato's later thought cannot be captured in a sentence or two, but it clearly involves his acknowledgment that a coherent account of the world must come to terms both with Eleatic uniformity and stability on the one hand and Heraclitean contrarieties and flux on the other. Aristotle systematically discusses the early Greek philosophers in his critical review of the data that a scientific inquirer must take into consideration. When the post-Aristotelian schools are founded, Democritean atomism is launched on a new life by Epicurus, while Zeno of Citium and Cleanthes, the earliest heads of the Stoa, look closely to Heraclitus in formulating their physics and theology. At the same time, when scepticism too becomes an acknowledged stance, first with Pyrrho and then in the post-Platonic Academy, Xenophanes, Protagoras, and Democritus, are invoked as being at least partial precursors. Pythagoreanism has a future that will be increasingly potent in the early Christian era, and its numerology was already embraced by the earliest Platonists.

Apart from such obvious indications of the early Greek philosophers' after-life, some of their salient doctrines become virtually axiomatic for all their successors who are not sceptics. These include the Parmenidean principle that reality as such cannot be reduced to or simply identified with everyday appearances; the Empedoclean selection of earth, air, fire, and water as primary elements; and above all, the assumption that the world as a whole is an intelligible structure with underlying principles that are accessible to human understanding. By the end of our period, with such figures as Democritus, Anaxagoras and Diogenes of Apollonia, the stage is set for the great cosmological issue that will in due course unite Platonists, Aristotelians, and Stoics against the atomistic Epicureans – the issue of whether the world is governed by a purposive mind or by purely mechanistic forces. In the areas of psychology and epistemology too, theories of the early Greek philosophers continue to influence later Greek thinkers, as, for instance, in debates about the composition of the soul or the reliability of sense perception.

Even outside the philosophical tradition itself, early Greek philosophers have captured the imagination of modern writers: Matthew Arnold wrote "Empedocles on Etna," one of his most ambitious poems; T. S. Eliot prefaced his *Four Quartets* with two citations from Heraclitus; Tom Stoppard, in his play *Jumpers*, recalls Zeno's arrow, which unfortunately kills a hare, and thus invokes another Zenonian paradox; Karl Marx wrote his doctoral dissertation on the differences between Epicurus and Democritus; and Oswald Spengler, author of *The Decline of the West*, wrote his dissertation on Heraclitus. These are but a few indications of early Greek philosophy's extraordinary impact on our cultural sensibility.

NOTES

1 See Mourelatos [155] 3: "No other field offers as inviting a challenge to the philosophical imagination, yet in as demanding an environment of

evidential and interpretive controls." (Bibliographical citations in this numbered form refer to the serial bibliography at the end of the volume.)

2 See Heidegger [152]; Popper [122]; and Cambiano [86].

3 See especially Burnet [6] ch. 1; Cornford [89]; Vlastos [187], [482]; Jaeger [481]; Kirk [123]. Comparison of the introductory pages of the following books will give a good sense of the different approaches of leading interpreters: Guthrie [15], Hussey [13], Barnes [14], and cf. Lloyd [124] 100–104.

4 In later antiquity, Pythagoras was credited with being the first to use the word "philosophy" and to call himself a "philosopher" (D. L. I.12). Even if this is accurate, it would be quite wrong to take the words in other than their literal sense, "love(r) of wisdom," without any technical or professional connotations. For further remarks on the fluidity of philosophy at this date, see Lloyd [154] 102–103.

5 The artificiality of excluding Hippocratic medicine from the history of early Greek philosophy has been eloquently argued in numerous works by Geoffrey Lloyd: see Lloyd [110], [111], and [154].

6 For instance Zeller [18]; Burnet [6]; Guthrie [15]; [16]; KRS [4], and largely Hussey [13]. An important exception is Barnes [14] whose massive study includes chapters on psychology, epistemology, ethics, and more.

7 See in this volume Algra, p. 50, and Graham, p. 176.

8 That view is particularly prominent in Burnet [6], and it is also emphasized in KRS [4]. This explains why both books exclude the sophists.

9 For an excellent justification of making the sophists integral to early Greek philosophy, see Kerferd [433] 2–14, where the history of modern misinterpretations is illuminatingly illustrated.

10 Diels [1]. For discussion of Diels' seminal work on early Greek philosophy, see Mansfeld in this volume p. 23, with much more detail in Mansfeld and Runia [27].

11 My translation of Kranz in Diels [1] vol.1, viii. Although Diels seems to have been the first to write a book with "Presocratics" in its title, the concept the term expresses is decisive in Eduard Zeller's great history of Greek philosophy, which strongly influenced Diels, as it has everyone since. Part I of Zeller's work (= Zeller [18]) concludes with the sophists, and he begins his Part II with Socrates. Zeller in turn was much influenced by Hegel [22], but Hegel's "first period, second division" comprises the sophists, Socrates, and the Socratic philosophers other than Plato and Xenophon.

12 Burnet [6] 1 n.1 already registers this complaint.

13 See Kahn [416].

14 See Most in this volume p. 332.

15 *Metaph.* I.6 987a29–b7. See also *Metaph.* XIII.4 1078b17-31, where Aristotle identifies Socrates' special contribution not with ethics but with inductive arguments and universal definition. It is doubtful whether Aristotle has any authority for saying this other than inference from Plato's early dialogues.

16 Opposition between pre-Platonic and pre-Socratic runs through the nineteenth century in German scholarship; see Most's article, cited in n.1 of his chapter in this volume, p. 360.

17 See D. L. I.18–19.

18 D. L. I.14. Diogenes' preface is the best evidence we have for ancient classifications of philosophers, divisions of philosophy, and how the whole tradition might be viewed in the later Roman Empire.

19 On Zeller, see n.11.

20 See H. Schibli, *Pherekydes of Skiros* (Oxford, 1990).

21 Most standard histories of early Greek philosophy include some discussion of "forerunners," the fullest being KRS [4]. Barnes [14] is the most austere, barely mentioning Hesiod and finding Pherecydes of "no philosophical interest." In this volume, exigencies of space are the main reason for restricting discussion of what, for want of a better term, we call forerunners. See, however, Algra, p. 45, Broadie, p. 205, Lesher, p. 225, and especially Most, p. 342.

22 Xenophanes is generally construed to be saying: "No man will ever have knowledge about . . . everything of which I speak." But the grammar also permits the construal ". . . knowledge of . . . all that I say about all things" (see Guthrie [15] 395 n. 3), which makes a more pointed statement in the context. I follow Lesher (in this volume, p. 229) in taking the Greek this way.

23 For Xenophanes' use of "all things," see Broadie and Lesher in this volume, pp. 211, 229. Notice that Parmenides' goddess tells her youthful addressee that he is to learn "all things" (DK 28 B1.28), and this expression is ubiquitous in Empedocles, Anaxagoras, and Philolaus.

24 I am grateful to David Sedley for this point, and for his calling attention to the absence of Homer from Heraclitus' list. Heraclitus does criticize Homer elsewhere, but he probably did not take him (as allegorists later did) to be a didactic polymath who gave a universalist account of the world.

25 For objections to this approach to the material, see Long [305] 127–32, and cf. Cherniss [87].

26 See Kahn [162] 109–13, KRS [4] 141–42, and Guthrie [15] 101–104.

27 See in this volume Algra, p. 59, and Laks, p. 252.

28 D. L. II.11. See Most in this volume, p. 340.

29 Plato, *Gorg.* 449b-c, *Hippias minor* 363c-369a, *Hippias major* 285b, and *Prot.* 318e; cf. Lloyd [111] 91–95.

30 Popper [122] 130.

31 Pierre Hadot. See his *Philosophy as a Way of Life* (Oxford/Cambridge, Mass. 1995) and *Qu'est-ce que la philosophie antique?* (Paris, 1995).

32 Euripides, fr. 910. The passage, from an unknown play, is cited in Greek by Burnet [6] 10; my translation.

33 In characterizing early Greek philosophy as I have done, I do not presume to speak for my fellow contributors. They have gone along with my preference to avoid the term "Presocratic," but it should not be assumed that they endorse the reservations about it that I have expressed.

34 My only distinctive contribution to this list is the last point concerning anxiety. The most sustained and careful treatment of social factors that may have helped to promote early Greek philosophy, and make it culturally distinctive, is the work of Lloyd; see especially Lloyd [110], [111], [154] 121–40.

35 See Herodotus II.109 and Aristotle, *Metaph.* I.1 981b23.

36 The question of which people originated philosophy was already debated among the Greeks; some assigned it to foreign peoples and others insisted on its Hellenic origin. See D. L. I.1-11.

37 *Metaph.* II.1 993a30-4, transl. W. D. Ross, in *The Complete Works of Aristotle*, ed. J. Barnes (Oxford, 1984).

JAAP MANSFELD

2 Sources

DOXOGRAPHI GRAECI

Because the works of the early Greek philosophers have been lost, our knowledge of their content is entirely dependent either on sparse verbatim quotations (though less sparse than for instance those relating to the early Stoics) or on various forms of reportage in all sorts of ancient authors. It has thus become customary to begin books of this kind with a critical review of our sources of information.

What is at stake is the reliability of these sources.[1] The ideal of an objective history of philosophy is a nineteenth-century invention. In antiquity history of philosophy was part of systematic philosophy, serving a variety of purposes. The ideas of earlier philosophers were used and interpreted in many ways, and, more often than not, served merely as springboards. This holds not only for the attitude of major thinkers such as Plato and Aristotle but also for the far humbler works consisting of collections of doctrines, with or without some biographical detail, that circulated on a fairly extensive scale. Such works were used, it would seem, in the context of a primary education in philosophy and also as quarries to be exploited whenever someone writing about a philosophical issue felt he should set off his own view against those of others, to improve upon an already existing view or to replace it with another.

Surveys of earlier philosophers and philosophies and even anthologies containing purple passages were also composed for the delectation of a more general public, but the doctrinal contents of such works as well as the selections that were made, though containing mostly traditional material, were often updated and reflected the interests and predilections of their times, which as a rule were indebted to those of the professional philosophers. The transmission of the views of the early Greek philosophers (the so-called *physikoi*) therefore is not only quite fragmentary but also often coloured or even biased.

The view of a part of this process of transmission that is still dominant but is beginning to be revised today was developed by Hermann Diels in his monumental *Doxographi graeci* of 1879 (still available in an unaltered reprint).[2] "Doxographer" and "doxography" are not ancient Greek words but neologisms coined by Diels presumably to express a fundamental contrast with biography, a genre he believed to be in principle unreliable. Doxography is concerned with *doxai*, "views" or "tenets" (also designated *dokounta*, or *areskonta*; Latin *placita*, or *opiniones*). Working out the ideas of his teacher Usener and in fact depending not only on the nineteenth-century *Altertumswissenschaft* but also to a certain extent on a (by his time partly forgotten) tradition starting in the sixteenth century, Diels argued that doxography proper began with a topic-oriented treatise in sixteen books, of which only fragments (already collected and edited by Usener) are extant. This was composed by Aristotle's pupil and successor Theophrastus: the *Physikôn doxai* or "Tenets of the natural philosophers." (Almost certainly, however, the title is *Physikai doxai*, "Physical tenets.")

According to Diels, some time in the Hellenistic period Theophrastus' work underwent a revision; it was abridged, but also expanded to include the doctrines of the Hellenistic philosophers and of some doctors and astronomers. This collection, purportedly used by later Epicureans; Cicero; Varro; Aenesidemus, who is a main source of the Neopyrrhonist Sextus Empiricus (later second century A.D.); the physician Soranus (c. A.D. 100); the Church Father Tertullian (c. A.D. 200); and numerous other writers, was called by Diels *Vetusta placita*, "Oldest tenets." That now lost work was then abridged in its turn and updated somewhat by an otherwise unknown person called Aetius, to be dated somewhere in the first century A.D.

Aetius' *Placita* too is lost, but Diels provided a reconstruction that, though not without major flaws, is basically correct.[3] He magisterially showed (1) that the extant topic-oriented *Placita* ascribed to Plutarch (but in fact by pseudo Plutarch) and dated to the second century A.D. is a (rather drastic) abridgement of Aetius (and that the greater part of the shoddy *Historia philosopha* ascribed to Galen is a further abridgement of a version of ps.-Plutarch); (2) that Ioannes Stobaeus (fifth century A.D.) in the first book of his gigantic and only partly preserved anthology, the so-called *Eclogae physicae*, had incorporated large portions of Aetius and preserved important material abridged away by ps.-Plutarch; and (3) that the Church Father Theodoret (also fifth century) in his *Cure for the diseases of the Greeks*, the only source to mention the name of Aetius (three times), had also used Aetius' work on an important scale.

Accordingly, Diels argued that the information on the early Greek philosophers contained in his reconstructed Aetius,[4] though debased and modified in the course of transmission, is linked to Theophrastus' great work in a direct and vertical line of descent. This lends an air of historical reliability to what we find there. A similar conditional reliability is postulated for the authors who used the *Vetusta placita* (a work Diels, perhaps wisely, did not attempt to reconstruct). Diels further argued that the following texts largely go back to Theophrastus himself: most of the doxographical passages in the first book of the ecclesiastical author Hippolytus' *Refutation of all heresies* (early third century A.D.), in the *Stromateis* of another ps.-Plutarch preserved by Eusebius, in several chapters dealing with the early Greek philosophers in the work of the otherwise unknown Diogenes Laertius (also early third century) entitled *Lives and maxims of those who have distinguished themselves in philosophy and the doctrines of each sect*,[5] and finally in a few other works of minor importance.

This reconstruction of the secondary tradition forms the backbone of Diels' splendid edition of the *Fragmente der Vorsokratiker* (1903), which he revised and expanded three times in his own lifetime, and which was further revised by Walther Kranz, who added an indispensable index volume.[6] This work too is continuously being reprinted, and it still is *the* basic edition of the texts of the early Greek philosophers. Fragments, both verbatim and secondary, are habitually cited with the numbering of Diels and Kranz (abbreviated DK). All other editions of the so-called Presocratics or of individual Presocratics, even though further material is occasionally added or verbatim fragments Diels believed to be spurious are authenticated, are entirely indebted to DK and so to the hypothesis concerning the genealogy of the secondary sources which underlies this work.[7]

Diels firmly believed that verbatim fragments (designated B-fragments) cannot be understood apart from the testimonia (designated A-fragments).[8] In spite of this, however, his format is designed to highlight the importance of the verbatim fragments. Hence, Diels gave each individual (or in the case of the Pythagoreans an individual group) its own numbered chapter, in chronological order and even in an order according to "succession," instead of following the supposedly systematic lay-out of Theophrastus, or that of the extant ps.-Plutarch. This procedure unfortunately often entailed the cutting up and distribution of the testimonia, which in the majority of our ancient sources tend to assemble and oppose to each other the views of several philosophers rather than discussing those of individuals. In this process Diels tended to overlook some details, or put them in a chapter where one would not suspect them to be. In our sources verbatim fragments too are sometimes quoted in clusters to illustrate an issue in natural philosophy or theology or ethics.

Diels' quasi-biographical mode of presentation, though based on a (too) clear hypothesis concerning the transmission, effectively obscures its own foundations and also inhibits access to the original sources themselves. The reign of the individual Presocratic fragment became firmly established, and the relative reliability of an A-fragment was believed to have been securely ascertained by the place assigned to its source in the tradition as reconstructed, that is, its counting as good or less good. The verbatim fragments on the other hand were viewed in the way works of art found in the course of a premodern excavation were appreciated, and so as having a value not dependent on the ruins that happened to preserve them.

This view, indeed, is not entirely false, and certainly not always. Such fragments often travel from one source to another, and the context in which we find them is by no means always decisive for their interpretation – even in those cases where we can be relatively or even entirely certain that what was copied out is the original work. Even here we should realize that quotation need not necessarily be exact; errors are unavoidable, and texts that are quoted may be adapted to their context.[9]

Before Diels' reconstruction of Aetius, scholars in Germany believed that all the above mentioned later authors had used, or revised, a common source already available in the age of Cicero. The *Vetusta* *placita* is what remains when Diels' Aetius has been subtracted: a nice example of a shrunken hypothesis. It is, therefore, not at all surprising that the section of Diels' overview dealing with the *Vetusta placita* is far from satisfactory, and that the nearer we get to Theophrastus, the more hazardous the route becomes. Following in the footsteps of Usener, Diels was not at all bothered by the fact that the majority of the larger fragments (those dealing with the principles) he ascribed to Theophrastus' doxographical work are cited from the *Physics*.[10] He also failed, apart from a remark tucked away in a later article,[11] to take Aristotle's influence into account, although Zeller had pointed out the similarities between Theophrastus' and Aristotle's accounts of the early Greek and Platonic principles.[12] To be sure, most Aristotelian passages dealing with the early Greek philosophers are to be found in DK, but Aristotle's role in shaping the tradition had fallen by the wayside.

Diels also failed to ask himself for what purpose *placita* had been collected in the first place, and why it was that they continued to be added to, abridged, or revised in other ways. He did not take into account the possibility, that before Aetius more than a single tradition may have existed, or that mutually diverging witnesses to the same tradition may have been available.[13] Those who contributed to the tradition(s) were in no way *obliged* to preserve their predecessors' material unchanged. But Diels' main purpose was to get as close as he possibly could to the undefiled Theophrastean origin of the doxographical tradition by unmasking what he saw as fraudulent practice, and so to come nearer to the pure fount of early Greek philosophy itself. It was a sort of rescue operation, which in itself of course is not at all a bad idea. But as already intimated, his hypothesis is currently being revised and in need of still further revision, so the account which follows, though still preliminary in the sense that this revision is not yet completed, will in part go beyond Diels.

TWO SOPHISTS AND PLATO

Collections of views were already composed by two sophists, Hippias and Gorgias. Plato and Aristotle among others presumably used them, and were influenced by them.[14] Hippias put together a topic-oriented anthology of related views in both prose and verse, culling the poets as well as what came to be called the philosophers.[15] This will have had the purpose of providing easy access, perhaps mainly for rhetorical purposes, to what must have been an already bewildering variety of ideas. By assembling related views from the old poets down to just before his own times, Hippias in effect emphasized agreement and continuity. Important echoes of his approach are to be found in Plato and Aristotle.[16]

Gorgias, on the other hand, stressed what he took to be the philosophers' insoluble disagreements. We still have a short paraphrase of a part of his original argument and a significant remark in one of his extant declamations.[17] In addition, his work is echoed in two early Hippocratic works, in Xenophon, Isocrates, and even in Plato.[18] The philosophers, so Gorgias stated, could not agree whether the things that are were one or (infinitely) many, whether they were generated or ungenerated, and whether motion exists or does not exist. He amusingly went on to argue that all were wrong. Both Plato and Isocrates provide lists arranged according to the number and nature of things that were assumed, a feature that we shall also find in Aristotle and others.

Plato and Aristotle combined the approaches of Hippias and Gorgias and added to the material they had collected. Indeed, a presentation according to similarity (e.g., a list of the views concerned with how many and what things there are) may be combined with one according to disagreement. In his later dialogues Plato, who had begun his career as a sort of Socratic sophist, turned more and more to the great masters of the past, discussing and adapting their ideas in order to go beyond them, and we may well believe that he had studied the original works of, for example, Anaxagoras, Parmenides, Heraclitus, Zeno and Empedocles. Still, his approach to these past masters was coloured by their reception in the sophistic works mentioned above, and also by the way the ancient thinkers had been interpreted by lesser followers.[19] This, for instance, is why Plato emphasizes Heraclitus' doctrine of flux and diversity and tends to neglect what he has to say about unity and stability, and why when speaking of Parmenides, he emphasizes his idea of the Oneness and immobility of all there is, though he is by no means blind to the question of Being (e.g., *Soph.* 241d).[20] Above all note that what we have in Plato is not doxography but a form of dialectic (see the following section on Aristotle), and that the more or less rigid schemes which underlie his expositions are presented in the course of imaginary conversations among civilised people, not as ingredients of a systematic treatise.

ARISTOTLE, THEOPHRASTUS, AND THE LATER *Placita*

Discussion of the tenets of his predecessors, often including Plato and Plato's immediate pupils, is a standard feature of Aristotle's systematic treatises (*pragmateiai*).[21] He prepared himself quite thoroughly by assembling a library, and presumably included abstracts and quotations in the critical monographs he wrote about Melissus, Alcmaeon, the Pythagoreans, Gorgias, and Zeno (D. L. V.25), a two-book treatise *Problems from the (writings) of Democritus* (D. L. V.26), and one in three books *On the philosophy of Archytas* (D. L. V.25). Only a few fragments of these works, still available to the later Aristotelian commentators, are extant. There can be no doubt that he also read and excerpted other major figures such as Parmenides and Empedocles, from whom he quotes individual lines and even a few longer passages. That he also used and was influenced by the anthology of Hippias already has been noted, and, as the author of a monograph on Gorgias, he had of course firsthand knowledge of the latter's argument. In addition, he was also influenced by the way Plato cited and used his predecessors. But Aristotle converted Plato's urbane approaches into a discipline, namely dialectic, which follows a set of specific rules set out explicitly both in the *Posterior analytics* and in the *Topics*.[22]

It is part of Aristotle's method, when engaged in the dialectical discussion of a problem (defined at *Topics* I.11 104b 1-8), to divide a genus into its species in order to review the relevant *doxai*, and to set out the disagreements and the views which are held in common, so as to evaluate and *criticize* them in the most apposite way, and to go on from there. Probably the best known example of this procedure is the discussion of the antecedents, from Thales to Plato, of his own theory of the four causes that takes up much of the first book of the *Metaphysics*.

One who embarks on the discussion of a question or problem (which may be put in the form of a statement) should proceed in an orderly way. He should establish what is the genus of the matter, for example, whether it is a question in one of the theoretical disciplines, such as physics (and then, of course, what is the species, for example, zoology), or ethics. Furthermore, four types of questions must be distinguished and treated separately – whether or not the object of the inquiry has a certain attribute or not, the reason why it has this attribute, the existence or nonexistence of the object of the inquiry, and its substance or definition (*APo.* II.1 89b24-35).

The categories play a crucial part in this connection, because it is of major importance to establish to what category (substance, quality, quantity, place, and so forth) the object of inquiry and its attributes belong (e.g., *De an.* I.1 402a7-10, 402a23-b3). Again, the four types of questions may be formulated for each category.

At *Topics* I.14 we are told how to select and classify statements (*protaseis*) or problems (*problêmata*) that are to be discussed; I quote parts of the text:

> Statements should be selected in as many ways as we drew distinctions in regard to the statement. Thus one may select the tenets [*doxai*] held by all or by the majority or by the experts.... We should also make selections from the existing literature and put these in separate lists concerned with every genus, putting them down under separate headings, for instance about the good, or about the living being, and about the good as a whole, beginning with the question What is it? One should indicate separately the tenets (*doxai*) of individuals, for example, that Empedocles [representing expert opinion] said that the elements of bodies are four.... Of statements and problems there are, roughly speaking, three sorts: for some are ethical, others physical, and others logical. Ethical are such as, for example, whether one should rather obey one's parents or the law, if they disagree, logical, for example, whether the knowledge of opposites is the same or not, physical, for example, whether the cosmos is eternal or not. The same holds for problems (105a34-b25).

Statements (or propositions) and problems may be exemplified by tenets, *doxai*; accordingly, as there are three classes of statements, so there are three classes of *doxai*: ethical, physical, and logical. This explains the title of Theophrastus' treatise, *Physikai doxai*, and also makes clear to what kind of context this work belongs.

A fundamental Aristotelian example of such a division of a (sub-) genus is to be found at the beginning of the *Physics*. It is concerned with three categories, namely the quantity, substance, and motion of the principles or elements, and, true to the precept of the *Topics*, names are added in some cases (*Phys.* I.1 184b15-21). Numerous other examples could be cited from Aristotle's technical treatises.

One can prove that Aristotle's method profoundly influenced the *Placita* literature because in numerous cases the types of questions and the categories determine the layout of individual chapters and indeed entire sequences of chapters in ps.-Plutarch. For example, Chapter I.7, "About the gods," first discusses the issue of existence and then goes on to list the various views (name labels added) about the substance and shape (i.e., the quality) of the gods. Chapters IV.2-7 are concerned with what the soul is, the number of its parts, the substance and location (category of place) of its ruling part, its motion, and the issue of its immortality (name labels added throughout). The *placita* on the earth (ps.-Plut. IV.9-15) ultimately depend on Aristotle's discussion at *De caelo* II.13, even as to part of their contents, and so on.[23]

My working hypothesis for Theophrastus' *Physical tenets* is that it was a systematic collection of the problematic tenets of the physicists (and presumably of some doctors) according to genera and species, and that he applied the method of division and availed himself of the types of questions and the arrangement according to categories. We have an explicit testimony that he also added the required objections (*enstaseis*).[24]

In his topic-oriented extant work *On the senses*, Theophrastus applies the method of division throughout. The main and explicitly stated division is between those who believe cognition is "by like" and those who assume it is "by unlike." But another division also plays a part, namely between those who believe there is a difference between sense perception and thought, and those who do not. Furthermore, within each group the members are arranged according to the number of senses postulated. The last philosopher to be discussed is Democritus. This is because, according to Theophrastus, he argues that cognition is both by like and by unlike and so fails to fit the main division. This structure, involving a division of representatives on either side of an issue followed by one or more exceptional tenets, is not typical of Aristotle's dialectical overviews, but it is entirely similar to numerous chapters in ps.-Plutarch.[25] Diels believed that *On the senses* is a large fragment of the *Physical tenets*, but this is by no means certain.[26] The predecessors of Aetius presumably used not only the *Physical tenets* but also other works by

Theophrastus. In fact, they may have used works by Aristotle himself or even, on occasion, the original sources or available epitomes of such originals. We may call this practice retrograde contamination. Still, it is clearly Aristotle's methodology as revised by Theophrastus that determines the layout of the *Placita*.

That a collection of this nature, including tenets of post-Theophrastean provenance, was already available in the time of the Stoic Chrysippus is proved by a verbatim fragment of the latter concerned with the soul's ruling part, quoted by Galen.[27] This collection already went beyond Aristotle and Theophrastus in that, like Aetius, it clearly brought out the profound disagreement (*antilogia*, or *diaphonia*) among the experts. In a sense this is a return to the manner of a Gorgias, but, in actual fact, it is a symptom of the impact of Hellenistic scepticism.

The relation of Seneca's *Natural questions* to the *Placita* traditions needs a fresh inquiry that cannot be provided here.[28] It is clear that he must have used material prior to ps.-Plutarch, and it is also clear that this can hardly have been Aetius, or Aetius alone: the differences are simply too substantial, and Seneca provides much more information on individual doctrines than Aetius, who moreover may have to be dated a bit later than Seneca. Presumably, Seneca had also studied original treatises in the field of meteorology. Yet, the *Natural questions* as to its topic-oriented contents corresponds – with omissions, and differences of order, differences that are complicated by the uncertainty about the original order of the books of Seneca's treatise – with Aristotle's *Meteorology* as well as with the third book of ps.-Plutarch, which is also about meteorology (including IV.1, on the Nile). The last Greek philosopher to be cited is Posidonius, just as in Aetius. There is a certain emphasis on the early Greek philosophers just as in Aetius, though Seneca is far more selective as to names (though fond of citing anonymi). With some hesitation, I would plump for the suggestion that among Seneca's numerous sources were one or more versions of *Vetusta placita*, in which he found the rather rich information about the early Greek philosophers – including perhaps even Aristotle, Theophrastus, and Posidonius – that he wanted to use. He is an independent and creative writer, so he used the information in an independent way. What above all tempts me to accept this suggestion is Seneca's procedure: he cites doctrines which he subjects to a *dialectical* scrutiny, stating objections, making the proper choice, and occasionally even coming up with a solution of his own. This is exactly the way many ancient authors used *placita* material.

SUCCESSIONS, DIOGENES LAERTIUS

Another type of literature dealing with the early Greek philosophers is the so-called *Diadochai tôn philosophôn*, (*Successions of the philosophers*).[29] This is an originally Hellenistic genre, of which no pure instances or large portions are extant.[30] The first to write a work with this title was Sotion (early second century B.C.), often quoted by Diogenes Laertius; he had many successors also cited by Diogenes. Aristotle speaks of a "succession" in the field of rhetoric (*SE* 34 183b17-33) by which he means that a pupil takes over from the master, though not necessarily in an institutional sense. The motivation for writing a history of philosophy in this manner mainly derives from the institutional practice of the established philosophical schools, starting with the Academy. In these schools, the head of the association had a successor (*diadochos*) who was appointed or chosen. Retrospectively, such lines of succession were also constructed for the Preplatonic period, and these successions of Preplatonics were in various way linked with the later philosophical schools.

Thus, a succession could be postulated in cases where a real or purported doctrinal affinity was sought and found. Aristotle, Plato, and Theophrastus, much interested in classifying people according to their doctrinal affinities, already speak of teachers and pupils.[31] Plato speaks of the "Eleatic clan" (*Soph.* 242d), whereas Aristotle designates the Pythagoreans as *Italikoi* (*Metaph.* I.5 987a10, I.6 987a31). All three are concerned with the relative chronology of their predecessors, especially Theophrastus in the fragments about the principles from the *Physics*.[32] Information of some sort about these matters must have been available.

What played an important part as well was the desire of some of the later "sects" to find themselves a venerable ancestor. The Stoics wanted to derive their philosophy from Heraclitus, and so provided a stoicizing (and quite influential) interpretation of Heraclitus.[33] The Neopyrrhonists (to some extent following the third-century Pyrrhonist Timon) looked for predecessors, or at least partial predecessors, as far afield as Xenophanes and other Eleatics. They also included Democritus, thus providing Pyrrhonist interpretations of these earlier thinkers or at least emphasizing aspects of their thought that were compatible with a creative interpretation.[34] Epicurus pretended to be an autodidact and to have learned nothing from the early Atomists, but the authors of the *Diadochai* included him and his followers nevertheless.

For philosophy itself there are successions comprising the whole of the field from Thales on the one hand and Pythagoras on the other to the Hellenistic period. We have the Ionian line, starting with Thales and including the Ionians and the "Socratics," who include the so-called minor Socratics and the Academy, Peripatos, Cynics, and Stoa. The Italian line, starting with Pythagoras, includes the Eleatics, Atomists, Early Pyrrhonists, and Epicureans. We also may find a third line called Eleatic that begins with Xenophanes and contains the Atomists, Pyrrhonists, and Epicureans. Some philosophers were considered to be outside these lines (D.L. VIII.91-IX.20). There are even occasional references to successions in Aetius' *Placita* (e.g., ps.-Plutarch I.3.1-9, Ionians and Italians) that Diels either ignored or declared to be later accretions. Hippolytus, presumably following Middle Platonist examples, presents us with a bizarre Pythagorean succession that has come to include Empedocles, Heraclitus, Plato, Aristotle, and the Stoics.[35]

Diogenes Laertius' work, though for the most part a treatment of the sects, is structured according to lines of succession, the Ionian in books II-VII and the Italian in books VIII-X. Hence, we find the early Greek philosophers who are Ionians starting with Anaximander (said to be the pupil of Thales and so linked to book I) at the beginning of book II, and the Italians-cum-Eleatics together with Heraclitus and Xenophanes (who are counted as "random") in books VIII and IX.1-49. Protagoras is added at IX.50-6 because he was purportedly a pupil of Democritus, and Diogenes of Apollonia at IX.57 for no visible reason.[36] Diogenes' treatment is very uneven. The early Ionians get only brief chapters, and the sections about the early Eleatics are also relatively short. Pythagoras and Pythagoreanism are treated on an extraordinarily large scale, though not yet in the mystagogical way of a Porphyry, or an Iamblichus; Empedocles (included among the Pythagoreans), Heraclitus, and Democritus are presented in fairly long sections.[37]

It would seem that Diogenes here reflects the preferences of his own day, or of the immediately preceding centuries. Before Philo of Alexandria, interest in Heraclitus and Empedocles (interpreted in a platonizing and pythagoreanizing way) already was quite strong in Middle Platonist circles.[38] The first Neopyrrhonist, Aenesidemus (first half of first century B.C.), is several times said by Sextus Empiricus to have philosophized "in accordance with Heraclitus." Although it is not entirely clear what this means, it must involve some kind of creative interpretation of Heraclitus. The pythagoreanizing Platonist Thrasyllus (early first century A.D.) wrote an *Introduction* to Democritus consisting of a biography and a catalogue of his works, the latter fully quoted at D.L. IX. 46-48.[39] Interest in the "ancients" is also noticeable in Plutarch, who is a Middle Platonist. His quotations seem to indicate that he had read a number of original texts, at least Parmenides, Empedocles, Heraclitus, and he defended the doctrines of several early Greek philosophers against an Epicurean attack (written more than four hundred years before) in his *Against Colotes*.[40] It would seem moreover that he was not so much dependent on doxographies.

The doxographies in Diogenes Laertius that are concerned with Pythagoras, Empedocles, Heraclitus, and Democritus are preceded by fairly extensive biographies, whereas biographical information about the other early Greek philosophers is thin, or even, as in Leucippus' case, absent (though he is part of the succession). This too shows that Diogenes Laertius, or the traditions he is following, attached a special importance to these figures. The biography of Heraclitus is perhaps the most interesting. Factually, little was known, so stories about his character, his behaviour, and his death were fabricated from the utterances in his book – an interesting example of the idea, prominent in Diogenes Laertius but also quite common in a variety of other authors, that a philosopher's life and his work should agree with each other.[41] The study of the life, activities, and sayings of a philosopher was in fact regarded as an indispensable preliminary to the study of his writings and doctrines. In the cases where no books were available, the philosopher's "life" itself, including acts, apophthegms, and so on had to suffice. Conversely, if biographical data were unavailable, they were made up from what a person wrote, or from what others were believed to have written about him. These practices gave ancient biography, or at least part of it, its bad name.[42]

BIOGRAPHY AND DOXOGRAPHY; HIPPOLYTUS

The genre of doxography, in Diels' view, was to be sharply distinguished from fanciful biography (in which he included the *Successions* literature and that *On sects*). There is some truth to this distinction, but generally it does not hold.[43]

An interesting feature of "lives" (especially in the context of a succession) is that various alternative versions of a person's affiliations, schooling, and personal fortunes may be given. Here not merely antiquarian interest but the desire not to lose possibly relevant information is at work. The alternatives are often interesting: Parmenides as a follower of Xenophanes, or perhaps rather as one of the Pythagoreans (D. L. IX.21). The choice depends on which interpretation of his philosophy is preferred, and so may influence his position in the succession. One should tread carefully and not attempt, at least not always, to cut knots. By citing such alternatives or varieties as are not patently absurd, an ancient author may at least be certain of preserving what is useful. In Diogenes Laertius this conservative fondness for alternatives involves his giving explicit references to a plurality of traditions, or more or less recherché sources for the cited bits of information. This feature is also characteristic of, for instance, Porphyry's *Life of Pythagoras,* that – like numerous Laertian lives, including Pythagoras' – also contains *doxai.* Whether or not these are historically correct is not to the point. (As regards Pythagoras most of them are not, in both authors.) The anecdotes cited in the lives serve to depict the character of the person concerned.[44]

A number of other so-called doxographies found in Diogenes Laertius, Hippolytus I, and ps.-Plutarch *Stromateis,* are widely believed, following Diels, to derive ultimately from Theophrastus.[45] Although it is impossible to go into the details here, a few remarks are in order.

First, the correspondences with the *Placita* literature are undeniable. But Theophrastus' *Physikai doxai* (as I prefer to call it) and the *Vetusta placita* are believed to have been structured according to topics. In fact, the version cited by Chrysippus (see p. 31) *must* have been topic-oriented, for the correspondences with the chapter on the seat of the ruling part of the soul in Aetius (ps.-Plut. IV.5) and others, who are representatives of *Vetusta placita* traditions, are really striking.

Secondly, Diogenes Laertius, Hippolytus, and ps.-Plutarch *Stromateis* are not topic oriented but person oriented: all the tenets held by an individual philosopher to be found there are collected in chapters or paragraphs dealing with this person. Thus at some time someone, or quite possibly even several people, must have gone through one or more topic-oriented collections of *placita*, and collected the tenets plus the appended individual name labels from the various chapters dealing with topics. The lost treatises by Aristotle and Theophrastus dealing with individual philosophers may also have been of some influence, but there is no evidence. If Diogenes Laertius is to be trusted, and I fail to see why he should not be in this case, the two instances where a double doxography is found, a general and a detailed one (for Heraclitus, IX.7-12 and for Leucippus, IX.30-33), show that both shorter and more detailed collections of *placita* concerned with individuals must have been current. Accordingly, the relation of this material to Theophrastus' *Physical tenets* is as tenuous as that of the *Placita* literature itself, or even more so.

The detailed account of Heraclitus' *doxai* includes remarks about the Ephesian's lack of information on some points (D.L. IX.11), and this is similar to what Theophrastus (*Sens.* 3-4) says about Parmenides; however, this similarity is by no means proof that Diogenes Laertius ultimately depends here on Theophrastus.[46] Where the doxographies that since Diels have been ascribed to Theophrastus are concerned, scholars who are quite severe in other cases, accepting as fragments only passages where a philosopher's name and/or the title of one of his works is found, tend to be quite soft-boiled.[47]

As to Hippolytus' *Refutation*, Diels strongly condemned the chapters dealing with Empedocles and Heraclitus in the first book as biographical and entirely neglected the treatment of these two philosophers in the later books, even though they include a number of important verbatim fragments, some of which are not found anywhere else.[48] Moreover, in these later books the interpretative point of view is the same as in the first. The intermediate origin of these fragments is disputed. I think that Hippolytus, for whom Empedocles and Heraclitus belong with a Pythagorean succession, here depends on a Middle Platonist-cum-Pythagorean tradition (see n. 37). The two early Greek philosophers are thus presented in a particular light, but the way they are coupled is not entirely different from the way they are linked together by Plato (*Soph.* 242d).

OTHER SOURCES

Interesting information, including a number of verbatim quotations from, among others, Heraclitus and Democritus, is to be found in the works of the Neopyrrhonist philosopher/physician Sextus Empiricus (probably second century A.D.). Most of these references are concerned with epistemological issues, and of course we owe the transmission of Parmenides' proem to Sextus.[49] But we should note that Sextus' aim is not to tell us what certain historical figures believed, but rather to tell us what, in general, the dogmatists believed and then to show the weaknesses of dogmatism. He also cites early Greek philosophers (including some verbatim fragments) who were thought to be close to Neopyrrhonism.

Plotinus (A.D. 205–70), on the other hand, is inclined to give a positive, though neoplatonically coloured account of those early Greek philosophers whom he believes to be important forerunners of a dogmatic Plato. His selection is restricted to individuals who figure in Plato's dialogues, and, though he is indebted to his Middle Platonist predecessors, some of his (sparse) quotations may point to a reading of the originals.[50]

The learned Christian Clement of Alexandria (later part of the second century A.D.), whose generally positive attitude to Greek philosophy is indebted to Philo of Alexandria, has worked important bits of information into the extant eight books of his *Strômateis (Patchworks).*[51] The fragments he has preserved include passages of Parmenides, Heraclitus, and Empedocles (again betraying a Middle Platonist background, of which stoicizing interpretations had become an integral part), but these are almost always integrated in a patchwork of quotations with connecting exegetic text.[52] Numerous other Christian authors who refer to the early Greek philosophers do so only to exploit the contradictions among their views and so to expose the follies of the Greeks. But they at least prove to have understood the structure and aims of the later *Placita* literature, which they exploited for a new purpose, namely to prove Christianity right.

To the anthology of Ioannes Stobaeus we owe not only otherwise unattested portions of Aetius, but also verbatim fragments (and pseudo-fragments) of Philolaus (this reflects the interest in Pythagoreanism of late antiquity), and a great number of *gnômai* taken no doubt from an existing anthology of the ethical writings of Democritus. It would seem that Thrasyllus, whose catalogue begins with the ethical treatises, exercised some influence on the later tradition (see n. 39).

THE COMMENTATORS, IN PARTICULAR SIMPLICIUS

Philosophical commentators explain texts, and if these texts contain remarks on philosophers, or arguments of philosophers, the commentators will have to explain these remarks; now and then too they will quote evidence to clarify their text or to underpin their interpretation. For example, the Neoplatonist Proclus' commentary on Plato's *Parmenides* has preserved several important verbatim fragments, or parts of fragments, of Parmenides that are extant nowhere else.[53] Proclus undoubtedly had access to a copy of the text. But far more important for early Greek philosophy are the commentaries on Aristotle's *Physics* and *De caelo* by another Neoplatonist, Simplicius.[54] The *De caelo* commentary is the earlier. According to the hypothesis of Tardieu,[55] both these commentaries were composed after 532, when Simplicius – after the closing of the Neoplatonist school at Athens and after the signing of the peace treaty with Persia that contained a clause pertaining to protection for the philosophers – would have settled and taught at Carrhae in Syria, close to the Persian border. But this is far from certain.

Simplicius cites several early Greek philosophers on an unprecedented scale. Presumably his motive was that their works had become rare.[56] Pagan Greek culture, especially philosophy, was persecuted by the Christian authorities, as Simplicius had experienced for himself, so he apparently did what he could to ensure its survival. In quoting on this scale, he may have been inspired by Christian authors such as Eusebius, who in the *Praeparatio evangelica* copied out passages from numerous pagan philosophers (most of the time to show how wrong they were). However this may be, we should be most grateful to Simplicius, for he is our *only* source for the extant verbatim fragments of Zeno and Melissus, for almost all the verbatim fragments of Anaxagoras and Diogenes of Apollonia, for the more important fragments of Parmenides, and for a great number of fragments from Empedocles' physical poem. Not all these texts were equally amenable to a Neoplatonist interpretation, though a number of passages in Parmenides and Empedocles certainly were.

In several cases these philosophers but for Simplicius would be little more than names today, and our view of Parmenides' difficult ontology and Empedocles' difficult physics would be quite deficient. Parmenides' cosmology did not interest him as much, so we are not well enough informed about it. But other works by early Greek philosophers were apparently no longer accessible to Simplicius. Heraclitus' name occurs in thirty-two passages in Simplicius' extant works, but even references *resembling* verbatim quotes are extremely rare and are at second hand. Why quote Diogenes of Apollonia and Anaxagoras extensively, and refrain from quoting Heraclitus? The same holds for Democritus, whose name occurs 163 times, and for Leucippus, with 26 mentions, who are often discussed by Aristotle. Their works are not quoted by Simplicius. Had they been available to him, we would beyond doubt have a different or at any rate a more complete view of Heraclitus and the early Atomists.

Simplicius' quotations enable us to see that the long continuous text of Parmenides, quoted by Sextus *M.* 7.111, is in fact a patchwork, combining passages from different sections of the poem and omitting crucial lines in the proem.[57] This should serve as a warning: even where we do have long verbatim fragments, we cannot always be certain that the extant text is correct, or allows a correct impression of the work from which it has been cited or compiled.

NOTES

1 My aims in what follows are strictly historical. The attribution of tenets to early Greek philosophers by means of the "*philosophical* assessment of a view as coherent or incoherent" proposed by Makin [75] risks projecting today's fashions upon the past.

2 I limit myself to that part of Diels' work [3] that is concerned with early Greek philosophy. Note that his book deals only with the doxography of *physics*. For a critical evaluation of it, see Mansfeld and Runia [27].

3 The criticism by Lebedev [46], [47] is unfounded; see Mansfeld and Runia [27] 333–38; the sources for or relating to Aetius are discussed at length in this book.

4 Synoptically presented: left-hand column for ps.-Plutarch, right-hand column for Stobaeus, the two columns united by an elegant horizontal brace to indicate descent from a shared archetype; to the left at the bottom, further testimonia to ps.-Plutarch, and to the right those to Aetius. Diels' *Doxographi Graeci* also contains editions of the relevant fragments

of Theophrastus (including the *De sensibus*), the first book of Hippolytus' *Refutation*, sections of Cicero and Philodemus, and other minor works.

5 D. L. II.1-17, VIII.51-77, 82–84, IX.1-60. Note that Thales, as the first of the seven sages, is treated in D. L. I.17-44, which includes his physical tenets (I.23-24, 27).

6 Published 1934–37 = 5th edition. The 6th edition, containing addenda, is essentially unchanged in subsequent reprints. Kranz introduced an influential but, in my view, questionable modification by beginning vol. I with early cosmological poetry and prose and gnomic literature. Diels had placed this material before the sophists.

7 No such hypothesis was (or is) available for most of the sophists included in DK. Note that Protagoras came to be included in Diogenes Laertius via the *Successions* literature; see p. 32.

8 See the explicit justification in Diels [2], vi, a work now largely forgotten and unfortunately never reprinted. There the distinction between A- and B-fragments is found for the first time. The testimonia are far more complete than in DK.

9 See Whittaker [80]. For the working methods of ancient authors, see Mejer [61] 16–29; on excerpting, J. E. Skydsgaard, *Varro the Scholar: Studies in the First Book of Varro's De re rustica* (diss. Copenhagen, 1968) 101–16; on the writing of treatises, T. Dorandi, "Den Autoren über die Schulter geschaut. Arbeitsweise und Autographie bei den antiken Schriftstellern," *Zeitschrift für Papyrologie und Epigraphik* 87 (1991) 11–33 and id., "Zwischen Autographie und Diktat. Momente der Textualität in der antiken Welt," in W. Kullmann and J. Althoff, eds., *Vermittlung und Tradierung von Wissen in der griechischen Kultur* (Tübingen, 1993) 71–83.

10 See Steinmetz [28], Mansfeld [69].

11 Diels [426] 7.

12 E. Zeller, "Ueber die Benützung der aristotelischen Metaphysik in den Schriften der älteren Peripatetiker," *Abteilungen der Akademie der Wissenschaften zu Berlin*, Philologisch-Historische Klasse 1877, 145–67. Repr. in O. Leuze, ed., *Eduard Zellers Kleine Schriften*, Bd.1 (Berlin, 1910) 191–214.

13 For other lost works dealing with *physicists*, cf. D. L. V.46, VI.101, X.27. Shorter and longer works could be simultaneously available. Thus the Aetius that ps.-Plutarch (who is extant) epitomized was in circulation as late as the fifth century A.D.

14 For more evidence and bibliography, see Mansfeld [29], and for Hippias, Patzer [77].

15 Clement, *Stromateis* VI.15.1; cf. D. L. I.24.

16 Plato, *Crat.* 402a-b, *Symp.* 178a-b, *Tht.* 152d-e, Aristotle, *Metaph.* IV.5 1009b12-32, *De an.* I.2 404a25-31, III.3 427a21-29. Note that poets and philosophers are cited together, though at *Metaph.* I.3 983b27-84a3, Aristotle emphasizes the difference between them.

17 Fragmentary summary at [Aristotle] *MXG* 5 (omitted from DK), and *Helen* (= DK 82 B11) 13: "... the arguments of the *meteôrologoi* [early term for philosophers of nature] who, substituting belief (*doxa*) for belief, demolishing one and establishing another, make the incredible and unclear become clear to the eyes of belief...."

18 *Anc. med.* 2; *Nat. hom.* 1; Isocrates, *Helen* 3 (ca 385 B.C.); Xenophon, *Mem.* I.1.13-14 (c. 370 B.C.); Isocrates, *Antidosis* 268 (c. 353 B.C.); Plato, *Soph.* 242c-e, 243d-244b. Isocrates' list is much more complete than Plato's, so it cannot derive from the latter's, and at the end he adds Gorgias, who assumed that there was no principle at all. Patzer [77] 85–86 mistakenly derives the accounts of Isocrates and Plato solely from Hippias, overlooking Gorgias.

19 For example, the Heraclitean Cratylus, Aristotle, *Metaph.* IV.5 1010a10-15.

20 *Tht.* 152d-183e, *Parm.* 128a-b. Plato says nothing about Parmenides' cosmology.

21 The loss of Aristotle's more literary works prevents us from knowing how he dealt with his predecessors there. He certainly spoke of them (e.g., in the dialogue *On philosophy*) but one cannot tell how far his way of doing so resembled Plato's dialogues.

22 See Mansfeld [44].

23 Cherniss [34] remains important as a thorough discussion of Aristotle's critical treatment of early Greek philosophy, but his view that Aristotle is invariably prejudiced goes too far; cf. Mansfeld [33] 155. McDiarmid [42] applies Cherniss' methodology to Theophrastus' account of earlier thinkers.

24 Taurus ap. Philoponus *De aeternitate mundi* 15.20-24 Rabe (Theophrastus fr. 241A FHSG = [37]); remnants of this procedure are still to be found in Aetius, for example, in 1.3. Fragments attesting the title *Physical tenets* are very few, and attributions since Usener and Diels have been whimsical; for instance, the passage at D. L. IX.22 (fr. 227D FHSG) refers to something Theophrastus said "in his *Physics* (ἐν τοῖς Φυσικοῖς), in which he sets out the *dogmata* of almost all (concerned)." The account of the principles cited by Simplicius also derives from the *Physics*, as noted p. 26. This too is structured according to division, being a further refinement of that in Aristotle's *Physics*; cf. J. Wiesner, "Theophrast und der Beginn des Archerefats von Simplikios' Physikkommentar," *Hermes* 117 (1989) 288–303 and Mansfeld [69].

25 See Mansfeld [40] and Runia [48].

26 See Baltussen [39].

27 Galen *De placitis Platonis et Hippocratis* III.1.9-17; see Mansfeld [30].

28 *Naturales quaestiones*, ed. H. M. Hine (Stuttgart, 1995). The title translates the Greek expression Θέσεις φυσικαί; for the formula and the idea behind it see Cicero *On the parts of oratory* 64, Seneca *Epistulae* 88.24, Quintilian *Institutes of oratory* 7.2.6-7. On the Chrysippean book title Θέσεις φυσικαί see Plutarch *On Stoic self-contradictions* 1035c, 1037b, 1047c. See further H. M. Hine, *An Edition with Commentary of Seneca Natural Questions, Book Two* (New York, 1981; repr. Salem, N.H., 1984) 33; N. Gross, *Senecas Naturales Quaestiones. Komposition, naturphilosophische Aussagen und ihre Quellen* (Stuttgart, 1989); A. Setaioli, *Seneca e i Greci: Citazioni e traduzioni nelle opere filosofiche* (Bologna, 1988) 375–452, esp. 378–80.

29 See W. von Kienle, *Die Berichte über die Sukzessionen der Philosophen* (diss. Berlin, 1961); F. Wehrli, ed. *Die Schule des Aristoteles.* VIII: *Eudemos von Rhodos* (Basel/Stuttgart, 1969); Mejer [61] 62–74; J. Glucker, *Antiochus and the Late Academy* (Göttingen, 1978) 161, 343–44; G. Giannattasio Andria, *I frammenti delle "Successioni dei filosofi"* (Naples, 1989); Mansfeld [51] 20–43. I refrain from discussing the literature "On sects" (*Peri haireseôn*) because the first "sect" or philosophical school was believed to be Plato's "First Academy" (D. L. II.47).

30 The papyrus fragments of Philodemus' works on the Academics and the Stoics (first century B.C.) come quite close, but they contain little on early Greek philosophy. Cicero *De natura deorum* I.25-41 contains much doxographical information on our subject, and is a witness to Epicurean use of *Vetusta placita* literature.

31 For example, Plato, *Parm.* 127b, 128a; Aristotle, *Metaph.* I.4 985b4-5, I.5 986b22.

32 For example, Plato, *Soph.* 242d; Aristotle, *Metaph.* I.3 984a11-13, I.4 985b22, I.6 987a29. For the relative chronology of early Greek philosophers, the much maligned Apollodorus remains our best source; see Mosshammer [71], Mansfeld [395], and J. Mansfeld, "Apollodorus on Democritus,"*Hermes* 111 (1983) 253–58, repr. in Mansfeld [32]. Note that chronographic notices by Eusebius in DK are still cited from Schoene's obsolete edition of 1866–75 not from R. Helm, ed. *Eusebius. Werke* Bd. 7: *Die Chronik des Hieronymus* (Berlin, 1913–26; repr. 1984^3 with preface by U. Treu) and J. Karsten, ed. *Eusebius. Werke* Bd.5: *Die Chronik des Eusebius aus dem Armenischen übersetzt* (Leipzig, 1911).

33 See Long [251].

34 See F. Decleva Caizzi, "Il libro IX delle 'Vite' di Diogene Laerzio," *ANRW* II 36.6 (1992) 4238–4301.

35 Aristotle *Metaph.* I.6 987a30-31 lists the *Italikoi* among those who influenced Plato, but next mentions Cratylus and Heracliteanism, and of course Socrates. The standard succession in the Ionian line is Archelaus-Socrates-Plato, and then the Stoics. For Hippolytus see Mansfeld [51].

36 He is linked with Anaximenes, as Aristotle had already done (*Metaph.* I.3 984a5-6).

37 See further Mejer [62] 3590–99, B. Centrone, "L'VIII libro delle 'Vite' di Diogene Laerzio," *ANRW* II.36.6 (1992) 4183–4217, and Decleva Caizzi (n. 34 above).

38 See Mansfeld [68], who develops Burkert [201], and Mansfeld [51], 208–42.

39 See Mansfeld [33] 97–104. Thrasyllus apparently regarded Democritus as a follower of Pythagoras.

40 See Westman [55]. On Plutarch as a source for early Greek philosophers individually, see the numerous papers of Hershbell [56–60] and also Mansfeld [51] 278–95.

41 See Mansfeld [33] 179–91.

42 See F. Leo *Die griechisch-römische Biographie nach ihrer literarischen Form* (Leipzig, 1901; repr. Hildesheim, 1965) 104–8; A. Dihle, *Studien zur griechischen Biographie,* Abhandlungen der Akademie der Wissenschaften zu Göttingen. Philologisch-Historische Klasse 3.37, 2nd edn (Göttingen, 1970) 104–7; G. Arrighetti, *Poeti, eruditi e biografi. Momenti della riflessione dei Greci sulla letteratura* (Pisa, 1987) 141–8 and 164–67; A. Momigliano, *The Development of Greek Biography,* expanded ed. (Cambridge, Mass., 1993) 70; M. R. Lefkowitz, *The Lives of the Greek Poets* (London, 1981).

43 D. L. III.47 distinguishes the *bios* (life) from the *doxai* (doctrines) of Plato, and VII.38 the *bios* of Zeno from the *dogmata* of the Stoics.

44 On *gnômai* and anecdotes, and their tradition, see Gutas [65] (also for earlier literature), P. Nassen Poulos, "Form and function of the pronouncement story in Diogenes Laertius' *Lives,*" in R. C. Tannehill, ed., *Pronouncement Stories* (Missoula, 1981), and J. Glucker, "Πρὸς τὸν εἰπόντα: Sources and credibility of *De Stoicorum repugnantiis* 8," *ICS* 13 (1988) 473–89.

45 For criticism of Diels' derivation of Hippolytus I from Theophrastus, see Mejer [61] 83–86; Osborne [52] 187–211; Mejer [62] 3591–97; Mansfeld [51] 1–56 (critical of Osborne); and Mueller [54] 4357–71. More research is needed, especially on Diogenes Laertius and ps.-Plutarch *Stromateis.*

46 The remark attributed *explicitly* to Theophrastus at D. L. IX.6 (fr. 233 FHSG) about the "half-finished character and inconsistencies" of Heraclitus' book does not apply to the overview in the detailed Laertian doxography.

47 This even holds for Mejer [62] 3593, who accepts the detailed Heraclitean doxography in Diogenes Laertius as Theophrastean.

48 Diels included only Hippolytus I in his *Doxographi Graeci,* though the verbatim fragments cited in the later books found their way into DK. For Hippolytus' text of these, see Osborne [52] (whose work is overpraised by Barnes [72] and criticized by Mueller [53] and Mansfeld (above n. 45)). On Hippolytus in general, see Mueller [54], who, in my opinion, goes too far in believing that some Gnostics used the early Greek philosophers in ways similar to Hippolytus.

49 Sextus' treatment and quotations of Parmenides seem to be dependent on the same intermediate tradition as those of Diognes Laertius; see Rocca-Serra [63].

50 See Gelzer [64] and Mansfeld [51] 300–307.

51 For Clement see Méhat [70] and A. le Boulluec, "Clément d'Alexandrie," in Goulet [151] vol. 2, 426–31; for Philo, D.T. Runia, *Philo in Early Christian Literature. A Survey* (Assen/Minneapolis, 1993) 132–56. Philo himself is of some importance as a source for a number of early Greek philosophers (see n. 38 above), but it is doubtful whether he or Clement ever consulted the originals.

52 For example, Mansfeld [51] 307–12.

53 No Greek text yet supersedes V. Cousin, ed. *Procli philosophi platonici opera inedita* T. III: *Procli commentarium in Platonis Parmenidem* (Paris, 1864; repr. Hildesheim, 1961). A critical edition by C. Steel is in preparation for the Budé series.

54 Edited by H. Diels, *Simplicii in Aristotelis physica commentaria* (Berlin, 1882–95) and J. L. Heiberg, *Simplicii in Aristotelis de caelo commentaria* (Berlin, 1894). Simplicius' commentaries on Aristotle's *Metaph*ysics and *Meteorologica* are lost.

55 M. Tardieu, *Routes et haltes syriennes d'Isidore à Simplicius,* Bibliothèque de l'École des Hautes Études, Section des Sciences Religieuses 44 (Louvain/Paris, 1990).

56 As he says about Parmenides, *In phys.* 144.28. He also notes that he possessed only one of the several works he claims were written by Diogenes of Apollonia, ibid. 151.24–29. For Neoplatonist methods of quotation, see Wildberg [81].

57 The passage was printed as a single fragment in early editions of DK. On the transmission of the poem, see O'Brien [76].

KEIMPE ALGRA

3 The beginnings of cosmology

I. INTRODUCTION: MYTH AND COSMOLOGY

Greek philosophical cosmology did not originate completely out of the blue. The first philosophical cosmologists – usually referred to as Ionian or Milesian cosmologists because they worked in Miletus, in Ionia – could react against, or sometimes build upon, popular conceptions that had existed in the Greek world for a long time.[1] Some of these popular conceptions can be gleaned from the poetry of Homer and Hesiod (eighth century B.C.). In Homer the cosmos is conceived as a flat earth, surrounded by the Ocean (Okeanos), and overlooked by a hemispherical sky, with sun, moon, and stars. In the eighth century the annual course of the sun and the rising and setting of some constellations were integrated into a primitive seasonal calendar. Lunations were used for small-scale calendrical purposes ("the twenty-seventh of the month is best for opening a wine-jar," Hesiod *Works and Days* 814) and at some point – although there are no traces of this in Homer of Hesiod – some form of lunisolar calendar was established.[2]

Traditionally such cosmic protagonists as earth, sun, and moon were thought of, and worshipped, as gods, even if their cult in Greece does not appear to have acquired the status of the cult of the Olympians, well-known from myth and poetry.[3] But even in Homer, when Zeus calls a meeting of the gods (*Iliad* XX.1-18), the rivers, except for Okeanos, and the nymphs also come along. Sun, earth, heaven, rivers, and winds could be addressed in prayers and called to witness oaths. Some Olympians too were connected – and in some contexts even identified – with particular cosmic phenomena (Zeus the cloud gatherer as god of the sky, Poseidon as god of the sea, and so on).

In addition, both within the Greek world and in the cultures of their near-Eastern neighbours mythical stories circulated about the *origin* of the world conceived as the successive birth of such cosmic deities.[4] In such a context, speaking about the cosmos meant speaking about the gods, and theories about the origin of the cosmos (cosmogonies) were actually stories relating the genealogy of the gods (theogonies). The classic early Greek example of the latter category is Hesiod's *Theogony* (second half of the eighth century B.C.).[5] In this work the first stages of the history of the cosmos are depicted as follows (*Theog.* 116-33):

> First of all Chaos came into being, and then broad-bosomed Earth (*Gaia*), a firm seat of all things for ever, and misty Tartaros, deep down in broadpathed earth, and Eros, the most beautiful among the immortal gods, he who loosens our limbs, and subdues the mind and thoughtful counsel of all gods and men. From Chaos, Erebos and black Night came into being, and from Night, again, came Aither and Day, whom she conceived and bore after having mingled in love with Erebos. Now Earth first of all brought forth starry Ouranos, equal to herself, so that it would cover her on all sides, to be a firm seat for the blessed gods forever. She also brought forth large mountains, the beautiful abode of the divine Nymphs who dwell in the woody mountains. She also bore the unharvested sea, seething with its swell, Pontos, without an act of delightful love. Then she slept with Ouranos and bore Okeanos with his deep eddies [. . .].

In the paratactic way characteristic of (Greek) polytheism, this story depicts the cosmos as a plurality of distinct divine entities: each god has his or her own province. The familiar Olympian gods emerge later on in the story and are even more fully anthropomorphic in character. But also the more "abstract" deities of these first stages, such as Night and Earth, who play their roles just shortly after the first beginnings from primeval Chaos, behave in an anthropomorphic fashion: they make love and beget offspring.

As a story (*mythos*) this may be attractive, but it is only an explanation of sorts. Why precisely god A comes to love god B remains as obscure as are the ways of love in the world of mortals. Readers or listeners may accept these elements of the story as true, but in an important sense they do not really *understand* what happens. Moreover, the explanatory mechanism of gods begetting other gods by making love apparently allows exceptions. The sea, for example, springs forth from Earth without an act of love. Nor is it in all cases clear why god Y is born from god X: the various stages of the story are not linked in a very perspicuous way. True, in many cases some sort of rationale beyond the birth of one god from another may be thought up, but this is always a matter of *interpretation*, and the sort of connections that such an interpretation may bring to light could be rather diverse. Night, for example, is said to have brought forth Day, and we may surmise that this is because Day follows Night. But elsewhere Night is also the mother of Death (212), perhaps because Night and Death share the same negative characteristics. Again, elsewhere (224) Night is also said to be the mother of Deceit, and some interpreters suggest that this may be because deceptions generally occur at night.[6] But such links are at best associative and vague, and they do not add up to a clear and coherent account.

It is illuminating to compare all this to the first philosophical cosmogony of which the outlines are more or less clear. It was devised by Anaximander a good century after Hesiod's poem. Its outlines have to be reconstructed from various pieces of indirect evidence (in particular ps.-Plutarch and Hippolytus, DK 12 A10 and 11) and opinions differ about a number of the details of this reconstruction. However, the main features of the following account should be fairly uncontroversial.

According to Anaximander (DK 12 A10), the cosmos as we know it originated from an eternal, and eternally moving, qualitatively and quantitatively indefinite primary stuff, the "boundless" (*apeiron*), through a process of successive stages. At the first stage a finite germ (*gonimon*),[7] is separated off from the boundless. It is said to "produce hot and cold," presumably because in some sense these opposites are already contained in it. At the second stage, the hot (apparently flame) and the cold (apparently a kind of moisture or mist) are actually separated, and the flame grows as a kind of fiery bark around the moist centre, part of which dries up and becomes earth. At the third stage, the tension between the opposite "elements" becomes so strong that the whole structure explodes. The fiery bark bursts open and its parts are flung outwards to form fiery rings at various distances around the centre, which still consists of earth and mist (from now on we follow DK 12 A11). Some mist is flung along and envelops the fiery heavenly circles, leaving open only some holes through which fire shines out. The result is the basic structure of the familiar cosmos: earth, water, and air (three manfestations of the "cold") at the centre, and "wheels" (Aetius II.20.1) of fire enveloped in mist around it at various distances. The fire which blazes through the holes are what we perceive as the heavenly bodies. In the rings of the heavenly bodies the battle between fire and mist continues to play its role: at times the holes are partly or fully closed by mist, at other times fire "regains" them, which accounts for various astronomical phenomena, such as the phases of the moon and eclipses of both sun and moon.

In the course of the process of the earth's drying up, living creatures are generated spontaneously from slime or mud. As fish or fishlike creatures, they are born in the wet parts and surrounded by thorny barks. When they reach the dryer parts, the barks break off and the creatures now live on land for a while. Finally, there is a picturesque account of the generation of the first human beings. Human infants could not have sprung forth in the same way as other creatures, for they are notoriously helpless during the first years of their existence. Hence, we are told, they started out as fetuses in large fish, and only emerged from these when they were strong enough to nurture themselves (see the texts printed at DK 12 A30).

In comparison with Hesiod's account much has changed. Instead of Hesiod's whole range of independent cosmic factors, we now find a more *reductive approach*: various stages of the cosmogony, including the account of the generation of living beings (zoögony), as well as some phenomena in the world as it presently is, are explained by reference to the interaction of only two factors (the hot and the cold), which have separated off right at the beginning from the boundless origin of everything. Furthermore, these basic explanatory factors are no longer more or less anthropomorphic gods. Instead, the genesis of the cosmos is explained in terms of recognizable elements of nature – in other words, the approach is *naturalistic*. Moreover, we can now understand the way the various stages of the process are connected. We know how the cold (in the form of the watery) and the hot interact and tend to destroy each other. Also the introduction of *analogy* adds to the intelligibility of the story.[8] The "germ" that the boundless produces at the beginning and from which the cosmos will grow is presented as a spermlike mass, and at the second stage fire is said to surround the wet kernel as a kind of bark. Indeed there is a striking similarity between the descriptions of the "birth" of the cosmos and those of the generation of living beings (and humans who are at first "enveloped" in fish). It is perhaps not too bold to speak of the application of a rudimentary biological model of generation.

There is a further difference between the mythical cosmogonies and their philosophical counterparts – a difference of context rather than content, which accordingly is often overlooked. Hesiod's *Theogony* presents itself as a *hymn*.[9] The contents of hymns were not usually original. They tended to articulate and embellish what was already given by tradition.[10] Hence they were particularly fit to be recited at important social or ritual events.[11] This also applied to theogonies, whose main function was to connect the existing pantheon to a supposed origin of the cosmos, and so they were often connected with ritual and cult.[12] No such connections to tradition and ritual are attested (nor are they plausible) for the early Ionian cosmologists. They appear to have indulged in theoretical activity for its own sake, they felt free to speculate, and as we shall see, they had no scruples about devising theories that were in crucial respects radically different from those of their predecessors.

2. THALES AND THE BEGINNINGS OF GREEK COSMOLOGY

The first of the three great cosmologists from Miletus was Thales. In antiquity he counted as the archetypical *uomo universale*: well versed in engineering as well as in mathematics and astronomy, and also involved in the politics of his time. For all that, he probably wrote nothing, and he was a shadowy figure already by the time of Plato and Aristotle. His geometrical activities appear to have been largely of a practical nature, and his astronomical work – most famously, his allegedly successful prediction of a solar eclipse[13] – seems to have been primarily a matter of description and measurement, with no clear connection to his more general cosmological views.

The difficulty of determining what these views were becomes apparent when we examine our earliest and most important piece of evidence, a passage in Aristotle's *Metaphysics* (I.3 983b6-984a4; DK 11 A12):

(1) Most of the first philosophers thought that principles in the form of matter (*hylê*) were the only principles of all things. For that from which all things are, and out of which all things come to be in the first place and into which they are destroyed in the end – while the substance persists, but the qualities change – this, they say, is the element and first principle of things. And this is why they say that nothing comes to be and nothing perishes, because such a nature is always preserved. [...] For there has to be some natural substance, either one or more than one, from which the other things come to be, while it is preserved.

(2) However they do not all agree on the number of first principles and on their form, but Thales, the founding father of this kind of philosophy, claims that it is water – that is also why he declared that the earth rests on water – possibly deriving this view from seeing that the nutriment of all things is moist and that even heat comes to be from this and lives by this; and that from which they come to be is the principle of all things. So this is why he developed his view, and also because he saw that the seeds of all things have a moist nature, and that water is the natural principle of moist things.

(3) There are some who think that also the very early writers who, long before our present generation, were the first to write about the gods (*theologêsantes*), had this view of nature. For they made Okeanos and Tethys the parents of generation [cf. Homer, *Iliad* XIV.201, 246], and they claimed that that by which the gods swear is water [cf. *Iliad* II.755, XIV.271], namely what the poets themselves call the river Styx. For what is oldest is the most honourable, and one swears by what is most honourable. But it may be considered uncertain whether this view about nature is old and time-honoured. However, Thales is said to have explicitly stated this opinion on the first cause.

This passage is part of a larger context in which Aristotle investigates whether and to what extent earlier thinkers anticipated his own theory about the factors (or "causes" as he labels them) that determine the nature of physical bodies and the way they change. Here he is dealing with "matter" (*hylê* or *hypokeimenon*), which he claims to be the only explanatory factor adduced by the earliest thinkers. In (1) he ascribes to this category of philosophers the main features of his own conception of matter, according to which the material principle of a thing (x) is not just that "out of which" (x) has come to be, but also that which persists in the process of (x)'s changing and thus constitutes its "basic stuff." In other words, the material principle is both that *from* which and that *of* which a particular thing is made.

If we were to map this general scheme onto the view ascribed to Thales in (2), namely that the material principle of all things is water, we would have to conclude that Thales claimed not only that all things come *from* water, but also that in some sense they really still *are* water. However, if we take a closer look at what exactly Aristotle ascribes to Thales in (2) and (3), that is, in the passages specifically devoted to him, we get a slightly different picture. Here there is no talk of water as a persisting basic stuff (nor, for that matter, of water as that into which all things will finally dissolve). Instead, the focus is on water as the *origin* of things. According to Aristotle, Thales may have drawn on the analogous cases of nutriment and seed, and these are both things from which something may be said to grow. Further, the explicit link between the idea that the earth rests on water and the claim that water is the principle (*archê*) of things makes good sense only when water is thought of as that *out of which* things such as the earth have arisen – the earth, having emerged from the water, is naturally represented as still resting on it. However, it does *not* make good sense if the assumption is that the earth still *is* water. In addition, we know that the comparison (alluded to in (3)) between Thales' tenet and the mythical views to be found in some poets was in fact made by the sophist Hippias. He is probably Aristotle's source here, in a work in which he grouped together opinions of both philosophers and poets on the basis of similarity (DK 86 B6).[14] Now the particular examples from the poets that Aristotle here provides definitely speak of the *origin* of things: Okeanos and Tethys are described as *parents*, and the point of swearing by the Styx was presumably that it was the oldest, that is, the first, of all things.

It is therefore safest to assume that Thales merely claimed that water was the *origin* of all things, not that all things *are* water. That this was sufficient for Aristotle to include him among the class of earlier philosophers who anticipated his own theory of matter is not as odd as it may seem. Elsewhere Aristotle is ready to submit that the earlier thinkers conceived of the Aristotelian causes in a rather vague and unclear way,[15] and after all, Thales is here said only to be the "founding father" of this kind of approach. So he may well have anticipated only one aspect of Aristotle's conception of matter.[16] His thesis about water, in that case, was cosmogonical rather than cosmological.

Two further observations on our text. First, the problem of the stability of the earth, which Thales is said to have solved by supposing that the earth rests on water, was to be a recurring problem in early Greek cosmology. However inadequate we may judge Thales' solution to be (because it invites the question on what then does water rest), we may charitably claim that it does reveal a rudimentary degree of systematization insofar as it constitutes a link between his cosmology and his cosmogony. The reductive strategy of using one explanatory factor to account for different *explananda* may be regarded as prefiguring what we find in the more elaborate system of Anaximander.

Secondly, part (3) indicates that Aristotle was unwilling to go along with those, like Hippias, who had claimed that Thales and poets like Homer were basically talking about the same thing. He argues that it is unclear whether Thales' view of nature is really as old as Homer and other poets. Whatever they may have *meant,* they did not *say* the same thing as Thales. They were talking about mythological entities (Okeanos, Tethys, and Styx), not about nature. In order to be juxtaposed to Thales, their words have to be *interpreted.* Thales however, is said to have explicitly stated (*apophênasthai*) his view about water as a first cause of nature. A similar view is expressed by Aristotle's pupil Theophrastus (*ap.* Simplicius *In phys.* 23, 29) who claims that Thales was really the first to "reveal the investigation of nature (*physiologia*) to the Greeks and that, though he had many predecessors, he was so much their superior as to outshine them all." Accordingly, Theophrastus' collection of *Physical opinions,* which is at the basis of much of our sources for early Greek thought, did not include the opinions of the poets. Eudemus, another pupil of Aristotle, treated the history of "theological" views of the early poets in a separate treatise, as a subject in its own right, distinct from the history of philosophy proper (Eudemus fr. 150 Wehrli).

So much for Thales' cosmogony. The information preserved about his conception of the world in its present state, that is, his cosmology, is equally scanty, and here again our main evidence is furnished by Aristotle (*De an.* I 411a7; DK 11 A22):

> Some say that it [i.e., soul] is intermingled in the universe. That, perhaps, was why Thales thought that all things are full of gods.

Aristotle's source, probably Hippias again, told him that Thales had said that all things are full of gods, and he conjectures that this probably meant that everything is somehow ensouled. In another passage, he also conjectures what being ensouled must have meant according to Thales (*De an.* I 405a19; DK 11 A22):

> From what people say about him, it seems that also Thales supposed that soul is some kind of moving principle – if, that is, he said that the [magnetic] stone has a soul because it moves iron.

Aristotle was apparently unsure about what exactly Thales had said or thought; but if the way he reconstructs his views in these two passages, on the basis of what he himself found in his source, is correct we may assume Thales claimed that there is some principle of motion in the whole of the physical world, even in apparently inanimate objects, and that we may call this "soul" and even "god" or "gods." Some notion of the divine, then, was retained in Thales' cosmology. The same holds true of the theory of Anaximander, who is said to have described the "boundless" as immortal and indestructible. These epithets were traditionally associated with the divine (cf. Aristotle *Phys.* III 203b13-15). Also Anaximenes, the third Milesian in line, called *his* basic stuff air, divine (cf. the texts printed as DK 13 A10). Even if this shows that the world picture of the early Milesians was not fully "secularized," it should be stressed that instead of the more or less anthropomorphically conceived cosmic deities of Hesiod we now have a more depersonalized or "physicalized" conception of divinity that does not readily allow for a description in wholly theistic terms.[17]

From the fact that the Milesians considered their first principle – be it water, air, or the boundless – to be divine, we may infer that they thought of it as somehow alive. As we saw, the evidence suggests that they also considered the cosmos, as the offspring of this first principle, to be in some sense alive. Such a view of the cosmos has been labeled "hylozoïsm" (from *hylê* = matter, and *zoê* = life). The term as such is anachronistic: it was first devised by Ralph Cudworth in the seventeenth century,[18] and strictly speaking, the Milesians had no conception of matter as such.[19] Nevertheless, as a descriptive label it usefully captures a feature of Milesian physics that sets it apart from both Aristotelian physics (according to which matter without form was incapable of producing change), and the cosmologies of the post-Parmenidean generation of early Greek philosophers, that is, the atomists and pluralists. The atomists and pluralists took over the Eleatic thesis that Being (in their case transformed into the atoms of Democritus, the elements of Empedocles, and the seeds of Anaxagoras) is itself immutable, and they accordingly denied that matter contains an internal principle of change. Hence, Anaxagoras and Empedocles introduced what Aristotle called external "moving causes" (Mind, or Love and Strife), whereas Democritus reduced all substantial and qualitative change to the rearrangement of eternally moving (but not living) and intrinsically immutable atoms. Contrary to these later views, the Milesians indeed appear to have assumed that matter had an intrinsic principle of change.

For all that, hylozoïsm was probably a tacit presupposition rather than an explicitly defended thesis, and it may well be for this very reason that it appears in various guises.[20] At any rate, it was not recognized as a position *sui generis* by Aristotle. As we noted, he did claim that Thales and his successors had only accepted material causes, but he was apparently unable to see matter as anything but inert.[21] That is why he objected against the Milesians that "wood does not make a bed, nor bronze a statue, but something else is the cause of the change" (*Metaph.* I 984a23-26). In his view the early materialist theories easily revealed their own shortcomings in this respect, so that "the very circumstances of the case led people on and compelled them to seek further" (984a18-20) and to discover what Aristotle himself would call the moving cause.[22] In other words, Aristotle had no patience with the idea that water, air, or the boundless can of its own accord change into a cosmos. Yet, this appears to have been precisely what the early Ionian philosophers believed. As an unreflective presupposition, this hylozoïsm was probably a remnant of the mythical world view that saw the elements of the cosmos as living and divine entities. After all, such a world picture was unlikely to be replaced overnight by a full-blown mechanistic materialism in which the cosmos was simply made up of blind and dead matter.

3. THE COSMOLOGIES OF ANAXIMANDER, ANAXIMENES, AND XENOPHANES

We shall now examine some further details of the cosmologies of Thales' successors. Like Thales, whose conception of a flat earth supported by water was probably indebted to earlier mythological world pictures, Anaximander stuck to the concept of a flat earth, which he thought of as drum-shaped, with its diameter three times its height (DK 12 A10). However, his account of the shape and position of the earth was crucially different. First of all, he dropped the entire idea that the earth needs support. This is Aristotle's report (*De caelo* II 295b10-16; DK 12 A26):

> There are some who claim its equilibrium to be the cause of its remaining at rest – among the ancients, for example, Anaximander. They argue that that which is situated at the centre and equally related to the extremes has no impulse to move in one direction – be it upwards, downwards, or sideways – rather than in another; and since it is impossible for it to move in opposite directions at the same time, it must remain at rest.

It has been claimed that even if we knew nothing else about Anaximander, this theory alone should guarantee him a place among the creators of a rational science of the world.[23] After all, he is credited with two important innovations: the (implicit) introduction of the Principle of Sufficient Reason, and the application of mathematical arguments to a cosmological question. The former claim is no doubt correct: the earth remains in position because it does not have a sufficient reason to move one way rather than another. But the second claim appears to be in need of qualification. It is true that our text refers to an argument from "equilibrium," but it is not clear why we should conceive of this equilibrium in purely mathematical terms. Indeed, elsewhere in Anaximander's cosmology, equilibrium appears to be a matter of opposing forces or elements (the hot and the wet), and it is plausible to assume that it is such a physical equilibrium that is at issue here as well. One might think, for example, of the mutual repulsion of warring opposites, which could explain the tendency of the earth to remain as far away from fire as possible, hence at the centre of the fiery rings of the heavenly bodies.

It may be that a similar conception of physical equilibrium was at the basis of Anaximander's puzzling claim that the ring of the sun is furthest from the earth, and that the rings of the stars (which may or may not include the planets) were closest, with the ring of the moon in between (DK 12 A11). After all, the ring of the sun obviously contains the greatest mass of fire, and given the opposition between fire and earth, it is not implausible that in the course of the process of cosmogony such a mass of fire should have been flung furthest from the centre.[24] It is also possible that this part of Anaximander's story was simply introduced to account for the apparent fact that the lower rings do not obscure the more remote ones. He may, in other words, have argued that the brighter light of the outer rings simply shines through the comparatively modest amount of mist surrounding the lower rings of fire. Whereas the commonly accepted sequence, with the stars at the greatest distance, would have led to the objection that the sun's ring should blot out part of the ring of the stars at those places where they intersect when seen from the earth.[25] On the former interpretation, we shall have to assume that Anaximander was ready to ignore the appearances (according to which the moon is nearer than the stars) for the sake of the overall system of his cosmology; on the latter, he provided an alternative account of these phenomena. On any account, the particular sequence he plumped for appears to have been closely connected with his idiosyncratic conception of the heavenly bodies as concentric rings of fire enveloped in mist. It was not taken over by any other Greek cosmologist.

Anaximander's attempt to specify the relative distances of these cosmic rings (DK 12 A11 and 18) has also been heralded as the first attempt to describe (part of) the orderly structure of the cosmos in mathematical terms. However, the details are very controversial and a modicum of scepticism is appropriate.[26] Most importantly, we do not really know Anaximander's arguments for choosing the numbers he put forward, and there are no indications that empirical measurements played any role.

Whether the orderly structure of Anaximander's cosmology does or does not involve its being inherently *stable*, is a moot point. The context in Simplicius (deriving from Theophrastus) where the only literal fragment has been preserved allows for different interpretations. It says that Anaximander claimed that:

> ... the source of coming-to-be for existing things is that into which destruction too happens "according to necessity; for they pay penalty and retribution to each other for their injustice according to the assessment of time," as he describes it in these rather poetical terms (Simplicius *In phys.* 24, 17; DK 12 A9; B1).

What is probably the verbatim quotation – here placed between inverted commas – decribes what is going on in what indeed are "poetical" and anthropomorphic terms. Nevertheless, the idea of time presiding like a judge over warring opposites that pay penalty and retribution for their injustice may plausibly be taken to refer to the orderly sequence of what are basically physical processes. We appear then to be told that processes of physical change, such as the gradual destruction (drying out) of moisture by fire, are reversible and will in fact be reversed. In principle this might simply mean that the predominance of one of the elements is followed by the predominance of the other, and that this process goes on *ad infinitum*.

However, Anaximander may also have believed that his cosmos would eventually resolve back into the boundless, and the text just quoted may accordingly be taken to refer to some sort of cosmic cycle: as soon as fire has "won" and dried out the entire cosmos, it is itself extinguished for lack of nourishment.[27] Such a conception would fit in well with his conception of the cosmos as a living and generated being, for such a being would normally be bound to die and disappear again. On the other hand, it remains unclear how we should envisage the details of the process. Thus one wonders how the cosmos in its final state (either as fire or as moisture) was supposed to be taken up by the quality-less *apeiron*.

According to the Greek biographical tradition, Anaximander's fellow Milesian Anaximenes was his pupil. This is how Theophrastus' account, preserved by Simplicius, presents him (Simplicius *In phys.* 24, 26-30; DK 13 A5):

> Anaximenes, son of Eurystratus, of Miletus, a companion of Anaximander, also says like him that the underlying nature is one and infinite, but not undefined as Anaximander said, but definite, for he identifies it as air; and it differs in its substantial nature by rarity and density. Being made finer it becomes fire, being made thicker it becomes wind, then cloud, then (when thickened still more) water, then earth, then stones; and the rest come into being from these. He, too, makes motion eternal, and says that change, also, comes about through it.

In this report, "the underlying nature" is an Aristotelian term, equivalent to "the material cause." Our discussion thus far has enabled us to see that the application of this term, by Aristotle or Theophrastus, to Thales' water or Anaximander's boundless is misleading because these cover only one aspect of the Aristotelian material cause: water and the boundless are that-from-which things are, *not* that *of which* they still consist. In the case of Anaximenes, the application is more appropriate, for not only does he have the cosmos originate *from* air (which is testified elsewhere, DK 13 A6), but he also claims that everything in our world still *is* air.

For the rest there are some obvious similarities with Anaximander: the basic stuff is one and infinite (or quantitatively boundless) and also divine (DK 13 A10). Moreover, of all the then known physical "elements," air comes closest to the qualitative indefiniteness of Anaximander's *apeiron*. It is a fair guess that the particular series of rarefied and compressed forms of air of which our text speaks is based on a rough pattern of common experience: we see air turn into fire or into wind, wind into clouds, clouds into water, water into mud (earth), and mud into stone.[28] However, we do not see a stone or even water turn into a plant. In these cases presumably, some kind of mixture (the sources are silent on the details of the mechanism at work) of primary elements (e.g., earth and water) is required. There is no need to assume that Theophrastus is here projecting back the later (Empedoclean or Aristotelian) conception of elements onto Anaximenes' system.[29] On the contrary, we may note that the basic model that is at stake here can be traced back to Anaximander, whose system implies that *nothing* in our cosmos comes *directly* from the originative boundless, but that all cosmic entities are the result of the joint workings of the opposites which have in their turn come from the *apeiron*.

Some further remarks on Anaximenes' application of compression and rarefaction as an explanatory mechanism. Insofar as we are dealing with a basic stuff whose quantitative changes are observed to account for alterations that are (or appear to be) qualitative, we may give Anaximenes the credit for the brilliant intuition that qualitative differences can be reduced to quantitative factors. All the same, we should note that the basic stuff at issue is not itself quality-less (as are, for example, the atoms of Democritus, which differ only in shape, size, and position), but is air. Moreover, what made later quantitative physics so successful was the application of mathematics to specify and explain the quantitative elements of the theory, and there is no trace of this in Anaximenes.

It was noted earlier that Anaximander used an element of common experience – the way water and fire interact – as the basis of his cosmogonical and cosmological explanations. Anaximenes continued on the same path and supported his claim that qualitative differences can be reduced to the quantitative process of condensation and rarefaction – and hence that air could turn into other elements when compressed or rarefied – by referring to the phenomenon that our breath is chilled when we compress it with our lips, and warm when we loosen our mouth (DK 13 B1). Anaximenes also resembles Anaximander in his use of analogy to shore up the main features of his cosmology. For he appears to have argued that just as air in the form of the breath-soul (*pneuma*) holds us together, so air surrounds and steers (*periechei*) the cosmos (B2; however, the authenticity of this 'fragment' has been doubted by some scholars).

Like Thales and Anaximander, Anaximenes addressed the problem of the earth's stability: it rides on air like a leaf floating in the wind (A20).[30] The same goes for the heavenly bodies, which are fiery but are supported by air (A7). Their turnings are explained by reference to currents of condensed and opposing air (A15). In abandoning Anaximander's conception of the heavenly bodies as rings, Anaximenes returned to the traditional hemispherical conception of the (cosmos and the) sky, which he compared to a felt cap turning around our head. He accordingly rejected the idea that the sun and the other heavenly bodies move under the earth; instead, he claimed that they are carried round the earth, being obscured part of the time by the higher northern parts of the earth (A7).

We cannot here deal at length with the various detailed explanations of meteorological phenomena, or the basis of the mechanisms of evaporation and condensation, which our sources ascribe to both Anaximander and Anaximenes. Suffice it to say that the views at issue found their way into the Greek meteorological tradition: a number of them recur, for example in Epicurus' *Letter to Pythocles*. The more general outlines of early Ionian cosmology did not have such a lasting impact. In the short run, however, they do appear to have influenced Heraclitus of Ephesus, whose views are discussed at length elsewhere in this book, as well as the enigmatic philosopher-poet Xenophanes, who as a young man left his native town Colophon in Ionia in 546 B.C., when it was captured by the Medes, to settle in southern Italy.

It is indeed more than likely that the latter's critique of the traditional Greek anthropomorphic conception of the gods (DK 21 B5, 14, 15, 16) was partly prompted by the demythologizing of the physical world by the Milesians. In addition, as was pointed out above, the Milesians did not abandon the notion of divinity altogether, but introduced a reformed and "physicalized" conception of it. It is conceivable and even plausible that this helped Xenophanes to conceive of his "one god" in what may be called pantheistic terms, as a cosmic entity (this appears to be suggested by Aristotle *Metaph.* I 986b21-24; DK 21 A30).[31] Finally, and most importantly from the perspective of this chapter, the ancient testimonies on Xenophanes' general cosmology show that he was in many details indebted to the Ionian tradition. Like the Milesians, he defined that from which all things are, and plumped for earth and water (B29 and 33). Rather like Anaximenes he claimed that clouds are exhalations from the sea, and that the heavenly bodies are ignited clouds (B30 and 32; A32 and 40). He conceived of sea and earth as opposites, engaged in a cyclical process between droughts and floods (A33), an idea that reminds one of Anaximander. He supported this claim by pointing to the existence of fossils in stones in Syracuse, Malta, and Paros, a remarkable example of the use of empirical evidence in support of a cosmological claim.

4. MILESIAN COSMOLOGY AND THE HISTORY OF PHILOSOPHY AND SCIENCE

The picture that emerges from the previous sections shows us that despite an undeniable debt to the tradition of mythical cosmology and cosmogony, the Milesians introduced a way of explaining the physical world that was new in a number of significant respects. Nevertheless their contribution has been assessed in fairly different terms. As we noted, Aristotle thought of their materialistic cosmologies and cosmogonies as the beginning of physics, which he regarded as part of philosophy. This view is still endorsed by the majority of modern scholars, but it has had its critics.

Hegel played down the more strictly physical or scientific importance of these early theories, claiming that their main point was of a more general philosophical character.[32] On the other hand, it has been argued more recently that, although we may be dealing with the beginnings of physics of science, we are not allowed to speak of the beginning of *philosophy*, for the simple reason that nowadays cosmology and physics no longer belong to philosophy.[33] However, one wonders whether this exclusive application of the term "philosophy" in its narrow twentieth-century sense sits comfortably with the very historicity of the concept of philosophy on the one hand and the conception of the history of philosophy as a discipline *sui generis* on the other. Indeed, one may argue that it would amount to a relapse into the basically unhistorical practice – familiar, for example, from Aristotle – of studying the philosophers of the past from the point of view of, and only insofar as they are relevant to, one's own philosophical views (or, more broadly, the views of the tradition or era one belongs to). Historians of philosophy, by contrast, should be able to bracket their own philosophical views where appropriate. In the present case this would amount to using the term "philosophy" not in any specific sense, but in a sense broad enough to cover what in different ages people (Aristotle, for example) were prepared to regard as philosophy.[34]

Also the label "science" has sometimes been denied to these early cosmologies because they were supposedly still too heavily indebted to the mythical tradition,[35] or too weakly supported by observational data. The latter point is an important one that raises the question of the *method* applied by these early thinkers. If we adhere to what is usually called the "Baconian" picture of science – the idea that science should take its starting point through a series of controlled observations – the theories of the Milesians can hardly if at all be called scientific, for they did not practise detailed and systematic observation. At the same time, it should be acknowledged that the questions that they addressed were for the most part very general ones, such as how the cosmos came into existence. It is hard to imagine how they could have coped with such questions along Baconian lines, that is, without resorting to a fair amount of speculation. Moreover, even their more specific theories were mostly concerned with what Epicurus was later to call *adêla* (nonevident things), that is objects that could not be observed clearly and directly, such as (the nature of) the celestial bodies. As a matter of course their theories about such objects were speculative, as indeed were those of later Greek physicists.

In our century the Baconian theory of science has been attacked forcefully by Karl Popper, who claimed that in general science does not proceed by such simple inductive processes, and that moreover the whole question of how scientific theories originate is of no importance. Science, in his view, is a matter of daring and interesting hypotheses that are to be judged by their explanatory power and, most importantly, by whether they stand up to criticism and to tests. Popper saw the early Greek philosophers, in particular Thales and Anaximander, as the founding fathers of this kind of scientific approach. Accordingly, he presented early Greek cosmology as a critical tradition to which each philosopher made his own contribution by testing the theories of his predecessors and by coming up with alternative hypotheses. Thales, he suggests, "founded the new tradition of freedom [...] the tradition that one ought to tolerate criticism."[36]

But this "Popperian" picture of early Greek cosmology is as hard to defend as its Baconian counterpart. For one thing, we do not know anything about the alleged tolerance of the Milesians, whereas the evidence on their immediate successors (cf. Xenophanes DK 21 B7 on Pythagoras; Heraclitus DK 22 B40 on Pythagoras and Xenophanes) suggests a self-conscious, scornful, and satirizing attitude towards the work of others, a far cry from the gentlemanly and constructive criticism presupposed by Popper. More importantly, precisely because the theories of the Milesian philosophers were mainly concerned with quite general questions and with objects that were not clearly and directly observable, and because such observational data as were available were of a rough and general kind, we can hardly speak of hypotheses that could be *tested* and *falsified* by any kind of observational evidence.[37]

Where, then, does all this leave us with respect to the "method" of the early cosmologists? We may well acknowledge that they made *some* use of observational data to support their theories (e.g., Xenophanes on fossils) and that they often used familiar phenomena or observable processes as an analogy, and thus as an explanatory model. It is true that this does not amount to a systematic and methodical use of observation, and it is also true that the observational data at issue in the analogies are of the same general kind as the theories themselves.[38] But the introduction of observational features as such should not therefore be pooh-poohed or disparaged. It was new, it helped to make the theories more intelligible, and as such it contributed to the development of a more "rational" world view.

Perhaps we may conclude as follows. Just as the activities of the Milesians cannot be labeled "philosophical" in any specifically *modern* sense of the word, so they are not to be called "scientific" in a specifically Baconian or Popperian sense either. Yet, to do justice to what they initiated and to their position in Greek intellectual history, we might regard them at least as protoscientists, standing at the gateway of the history of that part of ancient philosophy that was called physics.

NOTES

1 For a detailed treatment of how Homer and Hesiod shaped the culture inhabited by the earliest Greek philosophers, see Most in this volume, p. 342.

2 On early calendars and chronology, see Bickerman [83] 27–34.

3 See Burkert [85] 174–76.

4 Some of the main texts have been conveniently collected and translated by Pritchard [125].

5 For the remnants of other early cosmogonies ascribed to Orpheus and Musaeus, see DK 1 and 2; a survey in KRS, 21–33.

6 More examples of such interpretations are in West [135] 35–36.

7 The idea is certainly Anaximandrean, although we do not know whether he actually used the term *gonimon*. For the term *apeiron* (boundless) and its range of meanings in early Greek thought, see McKirahan in this volume, p. 139.

8 On the use of analogy, see Lloyd [108].

9 Cf. *Theog.* 11; 33; 37; 51; and *Works and Days* 654–59, which may refer back to the *Theogony*.

10 It is probably against this background that one should interpret Herodotus' claim (II.53) that Homer and Hesiod basically "gave to the gods their titles and clarified their provinces and (τιμάς τε καὶ τέχνας διελόντες), and made clear their various kinds" (εἴδεα αὐτῶν σημήναντες).

11 Hesiod may well have recited his own *Theogony* at the funeral games of Amphidamas in Chalcis. See West [135] 43–46; J. P. Barron and P. E. Easterling "Hesiod," in Easterling and Knox [95] 52–54.

12 For examples, see Pritchard [125] 1 (on an Egyptian creation myth); 60–61 and 332 (on the Babylonian Enuma Elish and its recitation). For a judicious treatment of various views on the connection between myth and ritual, see Kirk [106] 8–31.

13 A controversial issue: Dicks [170] is extremely sceptical on the astronomical achievements of the Milesians; for a clear and balanced review of the evidence on Thales and the eclipse, see Panchenko [180].

14 On Hippias as Aristotle's source, see Snell [183] and Mansfeld [29].

15 Cf. *Metaph.* I. 4 985a11-15 on Anaxagoras and Empedocles.

16 Cf. Mansfeld [32] 143.

17 Cf. Babut [164] 22. On this new conception of divinity, see Broadie in this volume pp. 205–7. It is possible (i.e., it might be inferred from Aristotle, *Phys.* III.4 203b7) that Anaximander claimed that the *apeiron* in fact "steers" (*kubernan*) all things. But, *pace* Solmsen [184] and Babut [164], there is no reason to take this otherwise than as claiming that the *apeiron* is somehow at the basis of the cosmogonical process.

18 R. Cudworth, *The True Intellectual System of the Universe*, published in 1678, esp. Book I, ch. III. In this work, Cudworth takes issue with various forms of atheism, arguing that they can be reduced to two main kinds: "atomick atheism" and "hylozoical atheism."

19 Burnet [6] 12, n.3 used this as an argument against the application of the term hylozoïsm. I would object that for us to be allowed to use the term it suffices that the Milesians' theories were "materialist" in the broad sense that Aristotle recognized, that is, that in explaining the physical world they did not invoke any other causes (whether incorporeal forms or any other kind of separate moving cause) apart from corporeal entities.

20 Cf. KRS, 98. The kind of materialism posited appears not to have been very strict; the material world, or its *archê*, are sometimes said to be *themselves* alive or divine, sometimes to *contain* soul or god (Thales). A similar ambiguity characterized the mythical world view, where the gods could be either *identified with* or said to *reside in* the elements of the cosmos.

21 Note that when he tries to elucidate the role of matter in his own system, he usually resorts to the analogy of the production of artifacts from some inanimate stuff. In such cases it is quite obvious that matter cannot initiate the required process of change. It is telling that, by contrast, the Milesians appear to have preferred the use of *biological* analogies.

22 Interestingly Cudworth, who does leave room for hylozoïsm as a position *sui generis*, follows Aristotle's account of the Milesians in this particular respect, and claims (op. cit., 113) that they recognized only "senseless and stupid matter, devoid of all understanding and life." According to Cudworth (ibid.) the first hylozoïst was Strato of Lampsacus, Theophrastus' pupil and successor as head of the Peripatos.

23 Cf. Kahn [162] 77.

24 This has been suggested by Mansfeld [12] vol.1, 59.

25 This interpretation has been defended by Bodnár [165], following a suggestion of Von Fritz referred to in Kahn [162] 90, n.5. For other suggestions, see Guthrie [15] 95 with n.1.

26 In fact it is not certain whether Anaximander specified the size (and hence the distance) of any ring other than that of the sun; the text of the

relevant source Hippolytus (DK 12 A11) is corrupt at the crucial point. Cf. Kahn [162] 94–97; KRS, 134–37.

27 See for example Mansfeld [12] vol.1, 62.

28 In view of the fact that it is not just air, water, and earth that we are dealing with, it is unlikely that this is simply a philosophical reformulation of the primacy of Ouranos, Gaia, and Okeanos in mythical cosmogonies, as Guthrie [15] 123 suggests.

29 Anaximenes' "elements" are not just the quartet "fire, air, water, earth" familiar from Empedocles and Aristotle, nor are they immutable, as in Empedocles.

30 On the Milesian cosmologists' fondness for such similes, see Most in this volume, p. 351.

31 This, admittedly, is a controversial point. For a judicious defence of the view I here follow see Barnes [14] 94–99; for a more sceptical view, see Broadie in the present volume, p. 210, and KRS, 171–72.

32 See Hegel [22] 178: "The proposition of Thales, that water is the Absolute ... is the beginning of Philosophy, because with it the consciousness is arrived at that essence, truth, that which is alone in and for itself, are one." On the other hand, Hegel [22] 187–88, finds the details of Anaximander's cosmology "a mere succession in time" containing "no real necessity, no thought, no Notion," and hence philosophically insignificant.

33 This position has been defended by Mansfeld [116].

34 The fact that the Milesians did not call *themselves* "philosophers" – Pythagoras is said to have been the first to use the term – is immaterial in this connection. They did not call themselves "scientists" either, and once the term "philosophy" had been coined, others used it to describe the activities of the Milesians.

35 This position appears to have been rather overstated by Cornford [88] [90] and Jaeger [481]. On this, see Vlastos [187].

36 Popper [122] 150.

37 This point was already made by Vlastos [187] before Popper published his views on the Presocratics. In a way the point was also made by the author of the fifth-century Hippocratic treatise *On ancient medicine*, who claimed that concerning the subjects studied by cosmology "it would not be clear to the speaker himself or to his audience whether what was said was true or not, since there is no criterion to which one should refer to obtain clear knowledge." See Lloyd [124] 113.

38 Thus the Anaximandrean idea that the cosmos grows out of a spermlike substance as if it were a living organism only presupposes a very rough observation of how living beings are generated. The fact that the analogy is not very detailed entails that the cosmic process is only described and explained in its bare outlines.

CARL A. HUFFMAN

4 The Pythagorean tradition

In the modern world Pythagoras is the most famous of the early Greek philosophers. The same was true in the fourth century B.C., when Plato wrote his *Republic*, some 150 years after Pythagoras left Samos in about 530, to emigrate to Croton in southern Italy, where Pythagoreanism would flourish. Plato has Socrates say that Pythagoras was "especially loved as a leader of education in the private sphere," and that his followers

> ...loved him for his teaching and handed on to posterity a certain way of life...and these latter-day followers even now seem in some way to stand out among others for their manner of life, which they call Pythagorean after him (*Rep*. X 600a9-b5).

However, beginning with Plato's successors in the Academy, the reputation of Pythagoras became seriously exaggerated, and by the fourth century A.D. in the Neoplatonic tradition, he had become the greatest of all philosophers, from whom both Plato and Aristotle borrowed their central ideas.

Unfortunately, Pythagoras' distorted post-Platonic reputation has hindered an accurate appreciation of his genuine accomplishments and also those of other early Pythagoreans, particularly Philolaus of Croton. Moreover, despite Pythagoras' fame, Pythagoreanism has been poorly integrated into recent studies of early Greek philosophy. It seems to mean either too much or too little: Pythagoras has either anticipated all of Platonic metaphysics, or it is impossible to say anything about him at all. In addition, classical studies have been torn between scholars who still uphold the Greeks as models of rational inquiry and those who emphasize the irrational in Greek culture. Pythagoras duly becomes either the first to recognize the role of mathematics in describing the order of nature, or a wonder-working shaman.[1]

The Pythagorean question, the problem of determining the beliefs and activities of the historical Pythagoras, arises primarily because Pythagoras wrote nothing.[2] It is an even more difficult problem than the parallel Socratic question, because no younger contemporary wrote about Pythagoras as Plato and Xenophon wrote about Socrates. The first detailed accounts of Pythagoras, treatises by Aristotle and his pupils that survive only in fragments, date to the late fourth century B.C. Our earliest complete accounts of his life and beliefs are from the third and fourth centuries A.D.: the works by Diogenes Laertius, and the Neoplatonists Porphyry and Iamblichus. These latter works arose in a spiritual climate in which there was a need to identify a divine man to whom all truth had been revealed by the gods.[3] Pythagoras, whose fame was great, but who had left no writings to contradict what the later tradition assigned to him, was admirably suited to play this role. Iamblichus calls him "the divine Pythagoras" (*On the Pythagorean life* 1), and Porphyry reports that "about no one else have greater and more extraordinary things been believed" (*Life of Pythagoras* 12.28). This view of Pythagoras was handed down through Proclus to the Middle Ages and the Renaissance, when Neoplatonism was widely influential.[4]

The hagiography of Pythagoras can first be traced back to a movement known as Neopythagoreanism, which started in the first century B.C. in Rome and Alexandria and flourished in the work of Moderatus of Gades in the first century A.D. and of Nicomachus of Gerasa in the next century.[5] Nicomachus presents the Pythagoras who is common in popular imagination: the great mathematician; founder of the quadrivium of arithmetic, geometry, astronomy, and music (*Introduction to arithmetic* 1–3). Nicomachus' Pythagoras also originated Plato's distinction between the intelligible and sensible worlds, and Nicomachus quotes from Plato's *Timaeus* to illustrate Pythagoras' philosophy. This Pythagoras, in fact, originated much earlier, in the later part of the fourth century B.C. among Plato's immediate successors in the Academy.[6] Paradoxically at this time, when, according to Aristotle's pupil Aristoxenus, the last of the followers of Pythagoras lived (D.L. VIII.46), Pythagoras himself was reborn in even greater form.

Detailed analysis of the later tradition is outside the scope of this chapter, but a grasp of its assumptions is crucial to understanding Pythagoras' true achievement. Too often Neopythagoreanism lives on in the study of early Pythagoreanism. Pythagoras is often not distinguished from his early followers, with the result that Pythagoreanism from the flourishing of Pythagoras himself (530–490 B.C.) down to Aristotle almost 200 years later is treated as a seamless whole. Pythagoras thus becomes the divine founder to whom Pythagoreanism was handed down fully formed.[7] Again, while the influence of Pythagoreanism clearly lies behind Platonic dialogues such as *Phaedo* and *Timaeus*, passages from Plato are frequently quoted uncritically as evidence for Pythagoras' thought.[8] Finally, granted that the later tradition must preserve some early material, the identification of what is early often proceeds without criteria other than what is commensurate with a particular scholar's conception of the greatness of Pythagoras.[9]

This modified Neopythagorean approach to Pythagoras has now been undercut by Walter Burkert's precise analysis of the later tradition.[10] He distinguishes two primary traditions about Pythagoreanism in the fourth century B.C. One is represented by Aristotle; the other began among Plato's successors in the Academy, Speusippus and Xenocrates. Aristotle (1) talks about Pythagoreans of the fifth century and never about Pythagoras himself when discussing metaphysics and cosmology (*Metaph.* I. 4 985b23); (2) refers to these Pythagoreans as the "so-called Pythagoreans," indicating that this is the name in common use, but questioning the connection between their thought and Pythagoras; (3) discusses Pythagoras himself in the fragments of his specialized works, but portrays him only as a wonder-working religious leader (e.g., Aristotle, fr. 191 Rose); (4) sharply distinguishes Pythagoreanism from the Platonic separation of the intelligible and sensible realms and from the introduction of the one and the indefinite dyad as ultimate principles. Aristotle's Pythagoreans recognize only the realm of sensibles and seem to identify numbers with sensible objects (*Metaph.* I. 6 987b29 ff.).[11]

On the other hand, the Academic tradition (1) makes Pythagoras himself the central figure rather than the Pythagoreans; (2) refers much of Plato's philosophy back to Pythagoras, including both the use of the one and the indefinite dyad as ultimate principles and also the cosmology of the *Timaeus*. It is this tradition that dominates later treatments of Pythagoreanism. Aristotle's account of Pythagoreanism makes sense of it as a system contemporary with the atomists, but simply was not as exciting as the tradition that makes Pythagoras the originator of Platonic metaphysics and at the same time gives the authority of ancient wisdom to Plato's system. One of the fruits of the Academic tradition is the large number of treatises forged under the names of early Pythagoreans, the Pythagorean pseudepigrapha, which seem to originate largely in the first and second centuries B.C.[12] These documents are the Pythagorean "originals" from which Plato and Aristotle are supposed to have derived their central philosophical concepts.

Thus, Aristotle's presentation of Pythagoreanism, although it also needs correction, is much more likely to allow us to appreciate the actual contributions of Pythagoras and fifth-century Pythagoreans than the Academic tradition. As one of the central controls for developing an accurate account of early Pythagoreanism, Aristotle's presentation undermines the assumption that what the later tradition frequently assigns to Pythagoras must contain a kernel of truth. The Pythagoreanism of late antiquity was not motivated by documentary evidence but by Pythagoras' status as the ultimate sage. Although the later tradition may preserve some reliable information about Pythagoras, its testimony cannot be accepted unless it agrees with sources earlier than his canonization by the Academy.

One final result of Burkert's revolutionary work is the stunning news that we do, after all, have some primary texts for early Pythagoreanism. A core of the fragments assigned to Philolaus of Croton do not fit the mould of the Pythagorean pseudepigrapha and, in fact, agree with Aristotle's account of fifth-century Pythagoreanism. Rather than making the more than 150 years of early Pythagoreanism a unified system, our best evidence distinguishes between Pythagoras and fifth-century Pythagoreanism and shows that there is more precise evidence for Philolaus than for Pythagoras himself.

PYTHAGORAS

Although Burkert's approach to Pythagoras may seem to diminish his importance, the early evidence still reveals that there was no more important figure in early Greek thought. Pythagoras' greatness lies in his introduction of (1) a powerful new vision of the fate of human beings after death, the doctrine of metempsychosis; and (2) a way of life tightly governed by a moral and religious code that took southern Italy by storm and still produced followers more than 100 years after his death.[13] However, while there is enough reliable evidence to trace the outlines of his achievement, the details of his teachings are often impossible to recover. An unusually cautious passage in Porphyry (*Life of Pythagoras* 19 – derived from Aristotle's pupil Dicaearchus) reflects the early evidence reasonably well. Upon Pythagoras' arrival at Croton:

> a great reputation grew up around him, and he gained many from the city itself as followers; not only men but also women... Now the content of his teaching to his associates no one can describe reliably... But the doctrines that became best known to the public were first, that the soul is immortal, then that it migrates into other species of animals... (tr. after Burkert).

Our earliest evidence associates Pythagoras with this transmigration of souls, metempsychosis. His contemporary Xenophanes mockingly tells the story that Pythagoras once urged a man to stop beating a puppy saying, "It is the soul of a friend; I recognized it when I heard it speak" (DK 21 B7). Traditional Greek religion, as reflected in the Homeric poems, emphasized the shortness of human life in contrast with the immortal gods. Upon death, the shade goes down to Hades where it has only the most tenuous existence, one so bleak that the hero Achilles asserts that he would rather "be a slave on earth even to a poor man with no land, than be king of all the dead below" (*Od.* XI.489). Pythagoras offers what Achilles asked for and more, rebirth on earth, and, through a cycle of rebirths, an approach to the immortality previously reserved only for the gods. Pythagoras may have originated the doctrine himself or drawn it from Egypt (Herodotus II.123) or India (more likely), but his introduction of it into the Greek world had a widespread impact, particularly in southern Italy and Sicily where he was active.[13] Pindar, in an ode for Theron of Acragas in Sicily written in 476 B.C., says that those who have kept free from injustice in three lives will pass to a marvelous existence in the Isles of the Blessed (*Olympian* 2.68ff.).

The details of Pythagoras' version of metempsychosis and its attendant view of the soul are impossible to recover. Common elements in later versions found in Pindar, Empedocles, and Plato provide possibilities but not certainty.[14] Is everybody reborn or just a select few?

Are we reborn just into human and animal lives or also into plants? Is there a set number of rebirths or is it an endless cycle? Plato and Empedocles envisage a fall from an original blessed state followed by a fixed period of incarnations after which it is possible to return to our original condition. Herodotus talks of being reborn into every form of animal before being reborn as a man (II.123).

Is the soul that transmigrates the unified personal soul that is responsible for our consciousness and activity in this life? This is the case in Plato, but in Empedocles what transmigrates is called a *daimôn* and not a soul (*psychê*), and Pindar (fr. 131 Schroeder) calls it an image of life (*eidôlon*) that sleeps while we are awake and our soul is active. Pythagoras' view of the soul is more likely to have resembled Empedocles' than Plato's. Nonetheless, the doctrine of transmigration inevitably raises the question of the relationship between our present consciousness and that part of us that is reborn and thus is an important influence in the development of the Platonic view of the soul, even though it is unlikely that Pythagoras assumed that view.[15]

The other main emphasis of the early evidence is Pythagoras' vast knowledge. This reveals itself in his authority in religious matters, his ability to perform miraculous deeds, and his broad appeal as a teacher of a tightly structured way of life that was a combination of quasi-magical taboos and moral precepts. Pythagoras' religious authority is buttressed by connecting him to the ancient wisdom of Egypt. Rites in Greece forbidding burial in wool are mistakenly known as Orphic and Bacchic but are in reality Egyptian and Pythagorean (Herodotus II.81); Isocrates says that Pythagoras brought knowledge from Egypt to Greece and specifically that he "showed more evident zeal for things concerned with sacrifice and holiness in temples than others" (*Busiris* 28).

Such claims of knowledge and authority inevitably led to violently different reactions to Pythagoras. We have already seen that Xenophanes mocks the doctrine of metempsychosis, but the sharpest criticism comes from Heraclitus. He calls Pythagoras "the chief of swindlers" (DK 22 B81) and says that he "practiced inquiry beyond all other men and, having picked and chosen from these writings, made a wisdom of his own, a polymathy, an evil trickery" (B129). His most famous criticism is found in fragment B40: "Much learning does not teach understanding, else it would have taught Hesiod and Pythagoras, and again Xenophanes and Hecataeus." On the other hand, Empedocles speaks of Pythagoras' learning in tones of the utmost respect:

> There was a man among them who knew remarkable things, who
> possessed the greatest wealth of intelligence, who was especially
> accomplished at all sorts of wise deeds. For, whenever he reached out
> with all his intellect, easily he beheld each of the things that are
> in ten and even twenty generations of men (DK 31 B129).[16]

These "wise deeds" may have been one of the main sources of controversy. Empedocles is probably referring to the type of wonder working that he claimed for himself, the ability to control the winds and rain as well as to raise the dead (B111). The fragments of Aristotle's writings on Pythagoras confirm this suggestion by emphasizing a series of miraculous characteristics and feats, such as his ability to be in two places at one time, his golden thigh (probably a sign of religious initiation), and his killing of a poisonous snake by biting it (fr. 191 Rose). Claims to such extraordinary abilities and a reputation for vast knowledge drawn from far and wide might well have seemed "evil trickery" to an outsider like Heraclitus.

Early in the fourth century, both Plato, in the passage at the beginning of this chapter, and his rival as an educator, Isocrates, emphasize Pythagoras' impact as a teacher of a way of life. Isocrates says that:

> He surpassed the other [teachers] so much in reputation that all the young wanted to be his pupils and their elders were happier to see their children associating with him than attending to the affairs of the household. And it is not possible to disbelieve this, for even now people marvel more at those who style themselves as his pupils for their silence than at those who have the greatest reputations as speakers. (*Busiris* 29)

What was the content of the teaching? The way of life must have been designed at least in part to ensure the best possible sequence of rebirths. Our most extensive body of evidence for its rules are the fragments of Aristotle's work on Pythagoras. Along with the miraculous deeds what bulks largest in Aristotle's account is a set of maxims handed down orally and known as the *akousmata* (things heard) or *symbola* (signs that distinguished Pythagoreans from others). These *akousmata* reveal a tightly structured life. There is a series of dietary taboos, such as the famous prohibition against eating beans, clothing taboos (the gods should be worshiped in white robes), and injunctions that govern almost all aspects of life, including even the most trivial actions (e.g., "Don't pick up fallen crumbs," fr. 195 Rose).

It is not surprising that a devoted few might have found such a restrictive life attractive, but the wide appeal suggested by the passages in Plato and Isocrates requires explanation. This breadth of appeal is further indicated by the fact that some of the leading figures of Croton and other southern Italian towns were followers of the way of life so that Pythagoreans had a large impact on politics (Polybius II.39). They were not a political party in the modern sense but were perhaps analogous to clubs of serious moral purpose such as the Masons. One could pursue a number of professions (general, physician, political leader) and still be a Pythagorean. However, their regimented rules of conduct, club meetings, and fanatical devotion to fellow Pythagoreans (e.g., the story of the Pythagorean friends Damon and Phintias – Iamblichus, *On the Pythagorean life* 233, from Aristoxenus) aroused suspicion and envy. They were the object of violent attacks, one in Pythagoras' lifetime c. 510 B.C. and another in the middle of the fifth century, which led to the burning of the club house in Croton and the decline of Pythagorean influence in southern Italy.[17]

Part of the appeal of the Pythagorean way of life was based on the charisma of Pythagoras himself. Burkert accepted the model that makes Pythagoras a shaman, a type of religious leader first studied in Siberian tribes. The shaman's authority is based on the ability to enter an ecstatic state and journey to the beyond.[18] These journeys might be the germ of the idea of the transmigrating soul, but there is no evidence for transmigration proper in shamanism. Shamanism could explain Pythagoras' miraculous deeds, but it does not account for the Pythagorean way of life. Since the way of life lasted long after Pythagoras' death, its appeal must be based on more than just his personal authority. I would suggest that its attraction, in addition to the hopes for one's soul in the next life, was the moral discipline that it imposed. The previously quoted passage from Isocrates makes a contrast between the eloquence displayed by pupils of the typical Greek rhetorical education of the day and Pythagorean silence. This might be a reference to secret doctrines. Exclusive societies are likely to have some secret doctrines (Aristotle, fr. 192 Rose), although such secrecy in Pythagoreanism is often overstated and, as Aristotle's testimony shows, much of Pythagoreanism was common knowledge. The doctrine of metempsychosis was widely known from the time of Xenophanes onward. Isocrates' remarks have much more rhetorical force if he is referring to a pervasive Pythagorean self-discipline of silence that is attested in the tradition (a five-year period of silence for initiates, D.L. VIII.10) rather than the ability of Pythagoreans to keep a few doctrines secret.

The self-discipline represented in Pythagorean silence and in adherence to the multitude of taboos is founded on a more basic belief that our actions are under constant scrutiny by divine powers. Thus the Pythagoreans were said to be surprised if anyone claimed never to have met a divinity (Aristotle, fr. 193 Rose). Moreover, the structure of the world is related to a system of rewards and punishments. The planets are the avenging hounds of Persephone (Porphyry, *Life of Pythagoras* 41), queen of the underworld; thunder is a warning to souls in Tartarus (Aristotle, *APo* II.11 94b33); and the sun and the moon are the isles of the blessed where the good may hope to go (Iamblichus, *On the Pythagorean life* 82). There are strong parallels to the cosmological myths that Plato includes at the end of a number of his dialogues and whose function is in part to show a mythic ordering of the cosmos in which we are subject to divine judgement for our deeds. As in Plato's myths, number symbolism also played a role in the Pythagorean view of the world. One of the *akousmata* says that number is the wisest thing, and Pythagoreans may have sworn by Pythagoras as "the one who gave the *tetraktys*" (Sextus Empiricus, *M.* VII.94), the first four numbers whose total is ten, which was the perfect number for early Pythagoreans. Since another *akousma* calls the *tetraktys* "the harmony in which the Sirens sing" (Iamblichus, *On the Pythagorean life* 82), it may be that the first four numbers were also valued because they were involved in the whole number ratios corresponding to the concordant musical intervals of the octave (2/1), fifth (3/2), and fourth (4/3). However, none of the late stories that assign the discovery of these correspondences to Pythagoras are in fact scientifically possible. The harmony that the sirens sing may also allude to the influential idea that the heavens made music by their motions, the famous "harmony of the spheres."

Granted that Pythagoras had a larger impact on the society of his day than any other early Greek philosopher, in what sense is it legitimate to call him a philosopher? Metempsychosis did exercise an important influence in Greek philosophy through its adoption by

Empedocles and most importantly by its prominence in Plato. However, the Pythagorean way of life seems far removed from the "examined" life for which Socrates called. Pythagoreanism has no room for free examination of ideas and philosophical argument but is based on the authority of the founder. The later tradition reports that Pythagoreans felt no need to argue for positions and rested content with the assertion that "he himself said it" (D.L. VIII.46). Nonetheless, the primary goal of all Greek philosophy from Socrates onward was not just rational argument but the living of a good life. Pythagoras can justly claim to have been the first thinker to set forth a comprehensive plan for a good life, a plan of life based on a view of the world that influenced Plato's myths if not the Socratic elenchus.[19]

EMPEDOCLES

Another way to approach Pythagoras is through his early successors, and here Empedocles is important. Since Empedocles introduced a rational cosmological scheme in response to Parmenides and was also a wonder-working sage, he is often thought to show that Pythagoras too could have combined these characteristics. Recent scholarship has shown convincingly that Empedocles strove to form a unity from these two strands of thought, and has questioned the traditional view that he wrote two separate poems, one on nature and another religious poem known as *Purifications*.[20] However, while the example of Empedocles shows that one thinker could attempt to combine the two strands, this provides no evidence that Pythagoras did so as well. In fact examination of the evidence for Empedocles suggests again that Pythagoras had little to say on natural philosophy.

Empedocles is frequently treated as a Pythagorean in the later tradition. Diogenes Laertius, in his *Lives of the philosophers*, includes him among the Pythagoreans (VIII.51), and some even made him Pythagoras' pupil, although Empedocles was born about the time Pythagoras died (490 B.C.). However, neither Plato nor Aristotle regarded him as a Pythagorean and few modern scholars have done so. It seems likely nevertheless that Empedocles was influenced by Pythagoras, since two generations earlier, near Empedocles' own home in Acragas in Sicily, Pythagoras was preaching the metempsychosis that appears in Empedocles' poetry and since Empedocles refers to Pythagoras with such reverence (see p. 72).

However, the ancient tradition made few connections between Empedocles' physical theory and Pythagoreanism, and there is no compelling reason to do so. Empedocles advanced, for the first time, the influential theory of the four elements (earth, air, fire, and water). He introduced Love and Strife as cosmic principles, whose conflict leads to the combinations of the elements that produce the phenomenal world as a phase between the completely homogeneous mixture of the elements in a sphere under Love and complete separation of the elements under Strife. None of the antecedents of this theory is likely to be Pythagorean. The four elements have their origins in Ionian speculation: Strife is a prominent element in Heraclitus; Love seems to be Empedocles' own innovation; and the sphere has connections to Parmenides. It is true that Love is connected to harmony, which is important in Pythagoreanism (it is also Heraclitean). Harmony is in turn represented in Empedocles (B96) as combining the elements according to ratios in order to form bone (four parts fire, two earth, and two water). This reference to number as governing the structure of things is the main aspect of Empedoclean cosmology identified as Pythagorean by the later tradition, and it may be that Empedocles is here taking the first step in adapting Pythagorean number symbolism to rational cosmology and that this idea was developed fully in the next generation with Philolaus. However, the use of numerical patterns in ordering the cosmos also goes back to Anaximander at the beginnings of the Ionian tradition.

Regarding the soul and its fate, matters are different. Since Pythagoras wrote nothing, Empedocles' writings came to be treated as basic Pythagorean texts in these areas. Sextus Empiricus (*M.* IX.126-30) says that "the followers of Pythagoras and Empedocles . . . say that we have a kind of communion not only with each other and the gods but also with irrational animals," and goes on to quote two fragments of Empedocles:

> Will you not stop the ill-sounding bloodshed? Do you not see that you
> are eating one another, in the carelessness of your thought? (B136)
> Father slays his dear son in changed form, having lifted him up in
> offering and praying in his great folly . . . (B137)

Sextus concludes: "This, then, is what the Pythagoreans recommended." It is no accident that stories sprang up that Empedocles was the first to break Pythagorean taboos on speaking about such things and was excommunicated (D.L. VIII.54-5). Indeed Empedocles' fragments on the cycle of reincarnation have an intoxicating vitality and specificity:

> There is an oracle of necessity, ... if someone stains his own limbs in slaughter by sin ... daimones who have as their lot a life of long ages, thirty thousand years he wanders away from the blessed ones, being born as mortal creatures of all forms, through time exchanging one troublesome path of life for another, for the might of aither pursues him into the sea and the sea spits him out into the dust of earth and earth into the rays of the shining sun which threw him into the currents of aither. One receives him from the other and all hate him. Of these I am one, an exile from the gods and a wanderer, trusting in raving strife. (B115)

Even in the area of religion, Empedocles by no means simply parroted Pythagorean doctrine. Aristotle's evidence (fr. 4 Rose) suggests that Pythagoras may only have taught abstention from certain types of meat, and it was left to Empedocles to advocate strict vegetarianism and to present the horrifying vision of a father eating his own son reborn in animal form. Moreover, Empedocles tries to integrate the discussion of reincarnation with his physical theory. The daimôn passes through each of the four elements in its reincarnations and is said to have trusted in Strife. The homogeneous mixture of the elements under Love may be the blessed state of the daimones before the fall.[21] It would be surprising that Empedocles constructed a unique physical theory to ground metempsychosis, if Pythagoras had already presented a detailed cosmology as a framework for the migrating soul. Despite Empedocles' praise of Pythagoras, he has transformed Pythagorean influence into a creation of his own.

Nonetheless it would be wrong to see Empedocles as the genius who gave form to a primitive Pythagoreanism. There is an important difference in emphasis between Pythagoras and Empedocles. Both wielded great charismatic authority, and the opening lines of Empedocles' poem remind us of later accounts of Pythagoras' arrival in Croton.

> Whenever I come to a flourishing city, I am reverenced by men and women, countless numbers follow along asking where the path to gain is. Some asking for oracles and others seek to hear a healing word for all sorts of diseases ... (B112)[22]

However, there is no evidence that Empedocles' philosophy had anything like the social dimension of Pythagoreanism. Empedocles himself may have participated in politics, but there were no Empedoclean clubs wielding political influence, no Empedoclean way of life that lasted for generations after his death.

PHILOLAUS

It is only in the generation after Empedocles, a little before the atomists, that Aristotle finds the beginning of a natural philosophy by "the so-called Pythagoreans" (*Metaph.* I.5 985b23). No names are mentioned, but the Pythagoreans prominent in this period were Hippasus, Lysis, Eurytus, and especially Philolaus. Sometime in the fifth century B.C., there was a split in Pythagoreanism. *Akousmatikoi,* who claimed to follow the original teachings (*akousmata*) of Pythagoras attacked another group, the *mathêmatikoi,* as being in reality followers of Hippasus (Iamblichus, *Comm. math.* 76.19 – from Aristotle). Aristotle's "so-called Pythagoreans" who "first laid hold of mathematics and advanced it" (*Metaph.* I.5 985b24) seem to be this latter group. Hippasus (fl. 470?), its founder, is consistently portrayed as a rebel, in one case as a democrat challenging the aristocratic Pythagorean leadership in Croton, but more commonly as the founder of Pythagorean study of mathematics and natural science. Legend said he was drowned at sea in punishment for mathematical work on the dodecahedron. His method of demonstrating the relation between whole number ratios and the concordant musical intervals, in contrast to the methods assigned to Pythagoras, is based on sound physics. Aristotle reports that, like Heraclitus, he made fire the basic principle. Unfortunately, it is unlikely that he wrote anything (D.L. VIII.84).[23]

Philolaus (c. 470–385 B.C.) was the first Pythagorean to write a book (D.L. VIII.84-85) and, after years in limbo because of questions about authenticity, the fragments of that book have now emerged as the crucial primary texts for early Pythagoreanism. Some fragments fit the pattern of the pseudepigrapha, assigning Platonic and Aristotelian ideas to Philolaus, and are thus spurious. However, a core of fragments (DK 44 B1-7, 13, 17) use precisely the concepts that Aristotle assigns to fifth-century Pythagoreanism and are therefore genuine and indications that Philolaus was Aristotle's primary source.[24] They reveal Philolaus as an important thinker in the tradition of early Greek natural philosophy.[25]

Philolaus began his book with a concise statement of his central thesis:

> Nature in the world-order was fitted together both out of things which are unlimited and out of things which are limiting, both the world-order as a whole and all the things in it. (B1)

The concepts here (nature = *physis*, world-order = *kosmos*) have an important place in earlier Greek thought. Moreover, although the Pythagoreans have often been regarded as *sui generis* and, beginning with Aristotle, primarily connected to Plato, Philolaus' basic principles, limiters and unlimited, are a response to the earlier Greek tradition of natural philosophy. For Anaximander the world arose out of the unlimited (*apeiron*), Anaximenes called his basic stuff, air, unlimited (DK 13 A1 and 6) and, in the generation before Philolaus, Anaxagoras began his book by asserting that in the beginning all things were "unlimited both in multitude and in smallness" (DK 59 B1). It is opposites like hot and cold, dry and wet that come from Anaximander's unlimited and that are labeled unlimited by Anaxagoras along with materials such as air and aither. These unlimited "stuffs" (i.e., both opposites and materials) dominated early Greek philosophy of nature. However, limit too had found its champion in Parmenides, who stressed that "what is" was held fast within limits and likened it to a sphere (DK 28 B8. 26, 42).

Philolaus draws on both these traditions, but is especially emphatic in his rejection of the dominant trend that made all principles unlimited, asserting instead that they fall into one of three classes:

> It is necessary that the things that are be all either limiting, or unlimited, or both limiting and unlimited but not in every case unlimited alone. (DK 44 B2)

He goes on to argue that the world-order manifestly has elements that are limits, for example shapes and structures, and that the concept of order necessarily involves the limitation of the unlimited. Philolaus' introduction of limiters as basic constituents of reality alongside unlimited stuffs leads him to redefine the essential nature of these stuffs. What makes them a unified class is not their qualitative features, such as hot and cold, but the fact that in themselves they are not determined by any quantity. They mark out a continuum of possible quantities that is then structured by limiters. The continuum of pitch is structured by limiting notes that define a scale; continua like water or earth become lakes or rocks when limited by shapes. Here we have a bold first step toward the matter-form distinction, although Philolaus gives no hint that these two types of element exist in any different way from one another and seems to treat them both as physical components of the cosmos.

In B6 Philolaus makes another crucial point about basic principles:

> ... the being of things which is eternal and nature in itself admit of divine and not human knowledge, except that it was impossible for any of the things that are and are known by us to have come to be, if the being of the things from which the world-order came together, both the limiting things and the unlimited things, did not preexist.

He is arguing that we cannot specify any particular set of unlimiteds (e.g., earth, air, fire, and water) or any particular set of limiters as eternal being, but that we can be sure that some set of limiters and some set of unlimiteds preexisted, since otherwise the world we know could not have come to be. In B2 and B6 Philolaus is accepting an axiom of early Greek thought sharpened by Parmenides, in not allowing anything to come to be from what is not. If the world has both limiting and unlimited features in it, these cannot have arisen just from what is limiting or just from what is unlimited. Philolaus' point is not that earlier Greek philosophers had not seen the world as an ordered place but rather that they had failed to make limiters principles in their own right and mistakenly tried to generate an ordered-world out of basic principles that were, in their own nature, unlimited.

Philolaus refers to the limiters and unlimiteds as *archai*, "starting points." Different sets of *archai* appear in other fragments, and it appears that the method followed in B6 with regard to the cosmos as a whole was used in each of the wide variety of subjects that Philolaus discussed. He begins by identifying a minimum set of starting points (*archai*) without which it is impossible to explain the phenomena. In the case of diseases, he specifies bile, blood, and phlegm as the *archai* (A27); in the psychic structure of human beings, the brain, the heart, the navel, and the genitals (B13).[26] When it comes to the sciences, geometry is the starting point from which the others develop (A7a). Much of this method remains obscure, but Philolaus is struggling towards a generally applicable methodology that resembles the axiomatization of mathematical sciences.

In B6 he argues that yet a third principle is required to explain the world. Since limiters and unlimiteds are unlike, they must be held together by some type of bond determining the specific way in which they combine to form the ordered world we see. Philolaus calls this bond "fitting together" (*harmonia*), and it involves the last central concept in his system, number. He uses the diatonic scale as a prime example of his system of principles. An unlimited (the continuum of sound) is combined with limiters (points on that continuum). However, this combination is governed by a fitting together according to whole number ratios 1:2, 2:3, 3:4 that define the central musical concords of the octave, fifth, and fourth respectively, so that the result is no chance set of notes but the diatonic scale.

Philolaus also has important things to say about epistemological questions. Fragment B6 belongs in the early Greek tradition of scepticism about human knowledge (cf. Xenophanes DK 21 B34). However, it is original in its almost Kantian thesis, that, since knowledge of "nature in itself" is not available to mortals, the best that they can do is to posit as principles what is necessary to explain the world as we know it, that is limiters, unlimiteds, and *harmonia*. Moreover, the function of number in Philolaus' system is to solve problems concerning knowledge of our world, perhaps in response to Parmenides, as is shown by B4:

> And indeed all the things that are known have number. For it is not possible that anything whatsoever be understood or known without this.

Number is taken to be the prototype of what is knowable. Nothing is more determinate and certain than a numerical relationship such as $2 + 2 = 4$. Philolaus thinks that the cosmos is held together by such numerical relationships and that Parmenides was right to object that the unlimited by itself is not a sufficient basis for human knowledge. In B3 Philolaus argues that, "There will not be anything that is going to know at all, if everything is unlimited."

This argument, that knowing requires an act of limiting, has particular force against Anaxagoras, who both posited basic principles that are all unlimited and also asserted the existence of a cosmic knower, *nous*. Philolaus may also be responding to Parmenides, arguing that even the unlimited may be knowable in so far as it is determined by number or involved in numerical relationships and that a plural world structured by such numerical connections is also knowable.

Both the strengths and weaknesses of Aristotle's account of Philolaus and early Pythagoreanism are now evident. Aristotle's famous assertion that for the Pythagoreans things "were numbers" makes sense as his interpretation of Philolaus. Since what is knowable for Philolaus is numerical, and for Aristotle what is knowable about things is their essence, it was an easy step for Aristotle to say that for the Pythagoreans numbers were the essence of things. At the same time, Aristotle has seriously distorted the situation, by criticizing the Pythagoreans for constructing physical things out of numbers. Philolaus does not think that things are constructed out of numbers, but out of limiters and unlimiteds (B1), principles mentioned in Aristotle but which appear largely unmotivated there. But Aristotle is right not to project this system of principles back onto Pythagoras. While the contrast between limiters and unlimiteds is not impossible in Pythagoras' time, these principles as well as the strong epistemological strain make better sense after Parmenides' reflections on the conditions for knowledge and his insistence that "what is" is limited.

Philolaus' cosmogony has been similarly distorted under the influence of Aristotle. The common view is that the first thing created was a monad or point. However, the fragments of Philolaus reveal that his cosmogony began with the central fire, the "hearth" of the cosmos and archetypal example of a combination of an unlimited (fire) with a limiter (centre). "The first thing fitted together, the one in the centre of the sphere, is called the hearth" (B7). Next, the central fire draws in the unlimiteds breath, time, and void (Aristotle, fr. 201 Rose). Philolaus draws an explicit parallel between the birth of the cosmos and the birth of a human embryo which, although hot in its own nature (like the central fire), breathes in cooling breath upon birth (A27). The biological analogy is not an archaic feature that goes back to Pythagoras himself as some have maintained but is paralleled in the atomists' cosmology, where a crucial step was the formation of a "membrane" around the embryo universe (D.L. IX.31).[27]

Philolaus' astronomical system has long been famous as the first to move the earth from the centre of the cosmos and make it a planet. Still, the earth does not orbit the sun but rather the central fire, along with the sun, moon, five planets, fixed stars, and a counter-earth. Copernicus saw Philolaus as an important predecessor, but scholars have taken this astronomical system to show that he was not a natural philosopher but a number mystic.[28] Certain a priori principles of order do play an important role in Philolaus' system: the counter-earth is introduced to fill out the perfect number ten, and fire is put in the centre because the most valued element belongs in the most valued place. But such considerations do not make the system mere fantasy. A priori principles play a prominent role in most Greek astronomical schemes. A rational astronomy should include a combination of a priori principles and a posteriori information that produces a system open to challenge by appeal to the phenomena. Philolaus' system does indeed confront a series of such challenges: problems of how to explain night and day and difficulties with parallax resulting from the motion of the earth are addressed (Aristotle, fr. 204 Rose, *De caelo* II. 13 293b25 ff.). Even the explanation as to why we never see the counter-earth or central fire, that is, that our side is always turned away from the centre of the cosmos, recognizes the importance of the phenomena. Moreover, the Philolaic system was the first to include the five planets known to the ancient Greeks in correct order. Philolaus may have speculated about inhabitants of the moon (A20) but so did such staid rationalists as Anaxagoras (DK 59 A77). In fact, the testimonia for both Anaxagoras' and the atomists' astronomical systems show that the Philolaic system is comparatively more sophisticated.[29] Philolaus' natural philosophy may have some origins in Pythagoras' emphasis on significant numbers, but it is primarily his own response to problems raised by figures like Anaxagoras and Parmenides. Philolaus was a Pythagorean because he lived the sort of life Pythagoras prescribed, not because of his views on natural philosophy. In the modern world, we may say that someone is a Catholic without therefore being at all clear what he believes on a whole range of philosophical issues. A Pythagorean could become a philosopher of the early Greek sort (a *physikos*), a mathematician, a physician, or even a leading general, but none of these pursuits were demanded of him as a Pythagorean. Philolaus was a natural philosopher who also happened to be a Pythagorean.

Neither Lysis, known mainly as the teacher of the Theban general Epaminondas, nor Eurytus the pupil of Philolaus, wrote anything. Eurytus illustrated the identification of man or horse with a specific number by making pebble drawings of them (Theophrastus, *Metaph.* 11). Archytas, the last great name in early Pythagoreanism, was a contemporary of Plato and therefore not properly an early Greek philosopher. Nonetheless, because of his sophisticated three-dimensional solution to the problem of the doubling of the cube and his work on musical theory, he fits the popular conception of the Pythagorean as a master mathematician better than anyone else in the early tradition.

Perhaps the most enduring legacy of the Pythagorean tradition was its influence on Plato. It is possible that when Plato went to Italy for the first time in the early 380s B.C. he met an aged Philolaus. Philolaus is mentioned in the *Phaedo* (61d), perhaps in recognition of Plato's debt to Pythagoreanism for his views on the soul.[30] Moreover, a Platonic adaptation of Philolaus' metaphysical system of limiters and unlimiteds is at the core of the *Philebus*.[31] Although Archytas is never mentioned by name in the dialogues, the Platonic letters show that Plato had extensive contact with him and owed to him his final rescue from Dionysius II of Syracuse in 361. Plato in fact quotes from one of the three genuine fragments of Archytas (DK 47 B1) in *Republic* VII 530d8 where he refers to music and astronomy as "sister sciences."[32] Indeed, the mathematical curriculum of the *Republic* could owe its inspiration to Archytas (B1), and Archytas himself, who was elected seven consecutive times in Tarentum and never suffered a defeat in battle, may be a model of the philosopher king. The specific functions of mathematics in Plato's philosophy (e.g., turning the soul toward the world of Forms) are largely his own creation, and the *Timaeus* is a Platonic and not a Pythagorean work. However, the conviction that mathematics could help in addressing important philosophical problems, which began with Philolaus and was shared by Archytas, and Pythagoras' own vision of the mythic cosmos in which the migrating soul is subject to judgement for its deeds, give Platonism an undeniable Pythagorean content from the middle dialogues onward.[33]

NOTES

1 For Pythagoras as pioneer mathematician, see A.N. Whitehead, *Science and the Modern World* (New York, 1925) 41. For Pythagoras the shaman, see Dodds [94] 143–45.

2 Burkert [201] 129ff., 218–20.

3 See P. Brown, *The Making of Late Antiquity* (Cambridge, Mass., 1978) 54–80.

4 O'Meara [224].

5 J. Dillon *The Middle Platonists* (London, 1977).

6 Burkert [201] 53–83.

7 Guthrie's great account of Pythagoreanism (in Guthrie [15]) spends 180 pages elucidating this unified Pythagoreanism and just 15 pages on individual Pythagoreans.

8 Guthrie [15] 206 ff.; Kahn [218] is more careful.

9 Guthrie [15] 181.

10 Burkert [201] 28–83.

11 Other passages (e.g., *Metaph.* VII.11 1036b8) have been misinterpreted as evidence for a Pythagorean derivation of the sensible world from more ultimate mathematical principles by the derivation sequence of one = point, two = line, three = surface, and four = solid, with physical bodies then arising from the geometrical solids. However, this belongs to the early Academy (Burkert [201] 67). Thus twenty pages ([15] 256–76) of Guthrie's account of Pythagoreanism are undercut. This sequence turns up in the *Pythagorean memoirs* (D.L. VIII.24–33) excerpted by Alexander Polyhistor (first century B.C.). Their value as a source is very doubtful (Burkert [201] 53 and Festugière [210]), but Guthrie uses them heavily. See Kahn [218].

12 Burkert [201]; Thesleff [202] and [199].

13 See Burkert [201] 126, 133; West [136] 62; Kahn [217] 166. Metempsychosis may have come into Orphism through Pythagoras (Burkert [201] 126, 133). Late sources assign it to Pherecydes (West [136] 25).

14 Burkert [201] 133ff.

15 See Laks in this volume, pp. 251–2; Burkert [201] 134, n. 78; Claus [486] 4–5, 111–21; Huffman [198] 330–31. Other early texts also stress Pythagoras' expertise on the soul (Herodotus IV.95, Empedocles DK 31 B129, Ion in D.L. I.120).

16 The historian Timaeus reported that these lines refer to Pythagoras.

Diogenes Laertius (VIII.55) says that some thought they refer to Parmenides. The "generations" and "wise deeds" fit Pythagoras better.

17 Minar [221].

18 Burkert [201] 162ff.

19 Some make Pythagoras more of a natural philosopher than I have done. My interpretation is based on a strict reading of the early evidence and seems to be Aristotle's interpretation. Guthrie [15] 166–67 relies on *Republic* VII as the sole early evidence of "the scientific side." But these are fourth-century Pythagoreans (Huffman [216]). Heraclitus' reference to Pythagoras' practice of *historia* is too general to be conclusive, and the Heraclitean concept of *harmonia,* if it alludes to Pythagoras, can just as easily refer to the Pythagoras I have described as to a Pythagoras who was an Ionian-style cosmologist.

20 Inwood [357]; Osborne [364]. For the interplay of cosmogonic and transcendent aspects of divinity in Empedocles' thought, see Broadie in this volume, p. 216.

21 There are difficulties (e.g., How is the transmigrating *daimôn* related to the physical intelligence that Empedocles identified as a mixture of the four elements to form blood around the heart?) that Empedocles does not address directly, and modern scholarship is divided on their answers. Long [366]; Inwood [357]; Wright [358]; Kahn [365].

22 For the full text of this fragment and discussion of Empedocles' profession of divinity, see Most in this volume, p. 355.

23 Von Fritz [212] argued that he discovered incommensurability. No ancient source directly ascribes this to him. On Hippasus, see Burkert [201] 206–8, 377, 457 ff.

24 Huffman [198] 17–35.

25 For the following account of Philolaus, see Huffman [198]. See also Burkert [201]; Kahn [217]; Barnes [14]; KRS.

26 For Philolaus' psychology, see Huffman [198]; Laks in this volume, p. 252; Sedley [228].

27 Kahn [217] 183–85. The "breathing in" of void does not mean that it is confused with breath, as he and Furley [99] 119 maintain. The same argument would suggest that time too is confused with breath.

28 Burkert [201] 240, 267, 337–50.

29 Contra Furley [99] 57–58. Kingsley [105] 172ff. has interesting things to say about why Philolaus introduced the central fire.

30 Sedley [228].

31 Plato is simply invoking the patron of all *technai* rather than referring to Pythagoras, when he talks of a "Prometheus" (*Philebus* 16c) by whom the system was hurled down from the gods. See C. Huffman, "Limite et Illimité chez les premiers philosophes grecs" forthcoming in *Études sur*

le Philèbe de Platon, ed. M. Dixsaut, vol. 2 (Paris, 1999) and C. Huffman, "The Philolaic Method: The Pythagoreanism Behind the *Philebus*" forthcoming in *Before Plato: Essays in Greek Philosophy, Volume* 6, ed. A. Preus (Binghamton, 1999).

32 Huffman [216]. On Archytas and Plato, see Lloyd [219].

33 G. Vlastos, "Elenchus and Mathematics," ch. 4 of his *Socrates: Ironist and Moral Philosopher* (Ithaca, 1991) 107–31.

EDWARD HUSSEY

5 Heraclitus

I. THE APPROACH TO HERACLITUS

1.1. Heraclitus of Ephesus must have been active around 500 B.C. Nothing is known of the external events of his life; the later biographical reports are fiction. Of Heraclitus' book, around one hundred fragments survive. It seems to have consisted of a series of aphoristic statements without formal linkage. The style is unique.[1] Heraclitus' carefully stylized and artfully varied prose ranges from plain statements in ordinary language to oracular utterances with poetical special effects in vocabulary, rhythm, and word arrangement. Many statements play with paradoxes or hover teasingly on the brink of self-contradiction. Many seem intended as pungently memorable aphorisms. (Translations in this chapter try to capture some of the ambiguities, where this is reasonably possible.)

1.2. The meaning and purpose of Heraclitus' book has always been found to be problematic, even by those who read it in its entirety. The Peripatetic Theophrastus (D.L. IX.6) diagnosed Heraclitus as "melancholic" (manic-depressive), on the grounds that he left some things half-finished, and contradicted himself; later Greeks named him "the obscure." Certainly Heraclitus did not always aim at expository order and clarity as usually understood. What remains shows that he often was deliberately unclear. Like a riddle or an oracle, he practised a deliberate half-concealment of his meanings, goading the reader to participate in a game of hide-and-seek.

The overt content of Heraclitus' remarks ranges from the internal politics of his native city to the nature and composition of the soul and the cosmos. He is repeatedly polemical, scornfully rejecting the beliefs of "the many" and the authority of those they follow, principally the poets.[2] Others, less popular but with claims to wisdom or knowledge (Xenophanes, Hecataeus, and Pythagoras, DK 22 B40), are attacked also.[3] In one place Heraclitus explicitly claims to have made an advance in understanding on *all* previous authorities known to him (B108). Only one person is praised for wisdom: the obscure sage Bias of Priene (B39).

Such polemics imply that Heraclitus is addressing himself to all who will listen, and has himself some positive teaching, with grounds for rejecting the traditional authorities and claiming a better access to the truth – on the same subjects that they had dealt with. In fact, the fragments contain many positive statements too as well as clear signs of a systematic way of thinking.

Since Aristotle, Heraclitus has often been grouped with the Ionian "natural philosophers" (*physiologoi*).[4] This is at least partly correct. Heraclitus was concerned with cosmic processes, and with the "natures" of things: he describes himself as "marking off each thing according to its nature, and pointing out how it is" (B1). It may be significant that he does not attack any of the Milesians by name.[5]

Yet the great range of his subject matter suggests that he is more than a natural philosopher. This chapter presents the evidence for seeing Heraclitus as pursuing a broader and a recognisably *philosophical* project: a radical critique and reformulation of cosmology, and indeed of all knowledge, on a new and surer foundation. In the process, he tries to overcome the systematic problems that dogged the Milesian enterprise: those of monism and pluralism and of the foundations of knowledge.

2. EXPERIENCE, INTERPRETATION, RATIONALITY

2.1. By what authority does Heraclitus claim to know better than the many and the poets? In the first place, he appeals to the knowledge gained by firsthand experience:

> All of which the learning is seeing and hearing: that I value most (B55).
> [Those who seek wisdom] must be inquirers into a good many things (B35).

Here Heraclitus aligns himself with the empiricism of two contemporaries, Xenophanes and Hecataeus of Miletus. The practice of firsthand inquiry (*historiê*), and the criticism of tradition and myth on the basis of common experience, were part of their programme. Xenophanes' parsimonious empiricism refused, in the realm of nature, to postulate any unobserved entities, or to contradict or go beyond the realm of common experience in its explanations. It demythologised the natural world implicitly, as Hecataeus of Miletus did explicitly. These same epistemic attitudes can be observed (cf. sections 4 and 5) in Heraclitus' cosmology and psychology.[6]

2.2. Yet Heraclitus also singles out these two by name for criticism, coupling them (a twist of the knife) with two others of whom they themselves were highly critical:

> Much learning does not teach the mind; otherwise it would have taught Hesiod and Pythagoras, and again Xenophanes and Hecataeus (B40).

Though "much learning" is necessary, it is not sufficient to "teach the mind"; that is, to produce genuine understanding. This point marks the second stage in Heraclitus' construction of new foundations. The mind must be properly "taught," or equivalently the soul must "speak the right language": otherwise the evidence presented to the senses, on which all else depends, will not only not be understood, but it also will be mistakenly reported *even by the senses themselves*:

> Bad witnesses are eyes and ears to people, when they have souls that do not speak the right language (B107).

Heraclitus is aware that the testimony of the senses is already shaped by our preconceptions. This makes it easier for him to explain how people, paradoxically, can fail to see what is before their eyes and hear what is filling their ears, as he thinks they constantly do:

> The fools hear but are as though deaf; as the saying has it, they are absent though present (B34).
> They do not know how to listen nor to speak (B19).

The analogy with language turns out to be omnipresent in Heraclitus, who himself exploits all the resources of the Greek language in his effort to represent the way things are.[7] The possibility of understanding is correlated with the existence of a meaning. It implies the need for *interpretation* of what is given in experience, as though it were a riddle or an oracle:

> The lord whose oracle is in Delphi neither speaks nor conceals: he gives a sign (B93).
> People are deceived in the knowledge of what is manifest, much as Homer was (though he was the wisest of the Greeks); he too was deceived by boys who were killing lice, when they said "those we took we left behind, those we did not take we carry with us" (B56).

2.3. If important messages come in the shape of riddles or oracles, the implications look discouraging: the true reality of things must be hidden, and there can be no system or fixed rules for discovering it – even though, when discovered, it will turn out to be something that in a sense has been known all along. One must be open to every hint.

> Latent structure [*harmoniê*] is master of visible structure (B54).
> Nature [*physis*] likes to conceal itself (B123).
> If one does not hope, one will not find the unhoped-for; it is not to be tracked down or reached by any path (B18).

2.4. The finding of the "latent structure," of the "nature"[8] of things, is the solving of the riddle. Heraclitus himself claims to have read the riddles of the world and of human existence. He is asking his audience to listen to his solution. Once again the question of authority presents itself: what guarantee can he give that he has guessed right? Heraclitus, who so brutally dismisses the claims of traditional authorities, cannot evade this demand.

> When one listens, not to me but to the *logos*, it is wise to agree [*homologein*] that all things are one (B50).

Logos, which appears here and elsewhere in significant contexts in Heraclitus, was a commonly used Greek word. It basically meant "what is said," that is, "word" or "story"; however, even in ordinary Greek speech it had rich ramifications of meaning. It had acquired the secondary senses of "mathematical ratio," and more generally "proportion," "measure" or "calculation"; in a further extension from these senses, it appears by around the time of Heraclitus in compounds with the sense of "right reckoning," or "reasonable proportion."[9]

Characteristically, Heraclitus both revels in the multiplicity of senses, and wants to bind them together into one. For him, *logos* has a special significance, in which each of its ordinary uses is allowed some resonance and is exploited as occasion serves. At the most basic level, Heraclitus' *logos* coincides with what Heraclitus is saying: it is his story about the way things are. Yet, as in the remark just cited (B50), it must also be distinguished from Heraclitus' words: it is not *as* Heraclitus' "story," that it commands assent, but because it shows what it is *wise* to think. (It is, though, still something that speaks, and that can be listened to; it still is the story of somebody or something, with language as its vehicle.) Heraclitus is not laying claim to any merely private revelation or purely personal authority.[10] Just what kind of authority does he claim for the *logos*?

> Though the *logos* is shared, the many live as though they had a private source of understanding (B2).
> Those who speak with mind must affirm themselves with what is shared by all – as the city does with a law, and much more strongly... (B114, part).

The *logos* is something "shared by all": publicly accessible, not the product of private fantasy. Its authority, deriving from these properties, makes those who use it "strong" in their affirmations, as the law makes a city strong by being impersonal, universal, and impartial. (On cosmic "justice," cf. section 6.) The oppositions between these properties and the private illusions and misunderstandings of "people," are elaborated in the programmatic declaration which stood at the beginning of the book:

> Of this *logos* which is always people prove to have no understanding, both before they hear it and when once they have heard it. For though all things come about according to this *logos*, [people] are as though they had no experience, though they experience such words and deeds as I set forth, marking off each thing according to its nature and pointing out how it is. But other people do not notice what they do when awake – just as they do not notice all the things they forget about when asleep (B1).

The oblivion of the public, shared world in sleep is shown by the substitution for it of private, unshared, and illusory dreams (a supposed "private source of understanding"), as confirmed by a later paraphrase: "Heraclitus says that for those who are awake there is one shared world, but that each sleeper turns aside into a private world" (B89).[11]

2.5. What then is this authority that the *logos* enjoys, and which is characterised sharply if obliquely in these statements? It can be none other than the impersonal kind of authority that is intrinsic to *reason* or *rationality*. Nothing short of that fits in with what is claimed of it, and *logos*, as already noted, was at this time already developing connotations of "reasonableness" and "proper proportion." It is consonant too with the riddle and oracle analogies: when once the solution to a good riddle is found, there is no doubt left that it *is* the solution, because everything fits, everything makes sense, though in an unexpected way.

Heraclitus, then, is claiming that his way of seeing things is the only *rational* way. How much work he is prepared to do to support this claim in detail, remains to be seen. At the least, it shows that he is committed to the recognition that there is a system, though a concealed one, in things, and a systematic way of thinking about them, once the clue, the "latent structure," has been found. For Heraclitus, the clue consisted in the structural pattern that may conveniently be called "unity-in-opposites." This is what gives substance to his claim that "all things are one."

3. UNITY-IN-OPPOSITES

3.1. Among the surviving sentences of Heraclitus, one group stands out as showing an intended common pattern, both verbal and conceptual. This is the pattern which it is convenient to refer to as "unity-in-opposites."[12]

Unity-in-opposites appears in Heraclitus in three distinct ways: (1) He presents, in suitably plain language, mostly without comment, *examples* of the pattern taken from everyday experience; (2) he *generalises* from these examples, in statements where the language verges on the abstract, seemingly in an attempt to state the pattern in itself; and (3) he *applies* the pattern in the construction of theories, in particular to cosmology (section 4) and to the theory of the soul (section 5).

3.2. First, the examples from everyday life. These are visibly two-faced. They are (where the original wording is preserved) mostly so arranged that the first word specifies, with emphasis, the one single thing, in which both the opposites are manifest. This recurrent verbal pattern helps to draw attention back from the interesting and paradoxically related opposites to the one thing, the "unity," in which they coexist.

A road: uphill, downhill, one and the same (B60).
Beginning is together with end [on a circle] (B103).
The path of carding-rollers [cylindrical rollers used in carding felt], straight and crooked (B59).
Into rivers, the same ones, on those who step in, different and different waters flow (B12).
The barley-drink too comes apart if *not* stirred (B125).
Disease it is that makes health pleasant and good, hunger fullness, weariness rest (B111).
Physicians cut and burn people, and ask for a fee on top of that (B58).
Donkeys would choose garbage rather than gold (B9).
... "Those we took we left behind, those we did not take we carry with us." (B56, part).

All of these remarks might be the material for riddles, as the last one was (cf. section 2.2). In play or in philosophy, they are examples of something amusing, disconcerting, and even confusing: that opposites, by means of which we structure and find our way about so much of our experience, are not purely and simply opposed and distinct. They are not to be thought of, as in Homer's and Hesiod's myths, as pairs of distinct individuals who simply hate and avoid each other. On the contrary, they are found in ordinary life to be copresent, interdependent, liable to change into one another, tacitly cooperating. If there were no such thing as disease, not only would we not find health enjoyable, there would be no such thing as health. Roads could not go uphill if they did not also, and at the same time, go downhill. Rivers can never stay the same except by a constant change of water. The paradoxical behaviour of doctors – who expect rewards for doing unpleasant things to people – and of donkeys – who prefer humanly worthless garbage to humanly valued gold – shows that the same thing can at the same time be both valued and rejected for the very same qualities.

Such remarks have sometimes been read as implying (a) that the oppositions in question are unreal, because the opposites are either illusory or in fact identical; or (b) that they are merely relative, to a point of view or a context.

(A) For the reading on which oppositions are *unreal*, there is no support in Heraclitus' own words. When he claims that day and night "are one" (B57), he does not mean that they are *identical*, but, as B67 makes clear, that they are "one thing" in being the same substratum in different states.[13] In fact, as will be seen, Heraclitus' thinking presupposes both the reality, and the real opposedness, of opposites.

(B) The reading on which opposites are always *relative* fails, equally, to account for the theoretical weight Heraclitus ultimately wishes to give to opposites. It is true that some examples show Heraclitus exploiting phenomena that are naturally explained by relativity: the different preferences of donkeys and human beings, or those of cattle, pigs, poultry, or apes (B4, 13, 37, 82), in contrast with those of human beings. So too the observations about disease and health, and so on, might just be pointing at the relativity of our assessments of what is pleasant and good. Such a reading could then go on to relativise the other examples: the road's being uphill or downhill is relative to the direction of travel; the river's being the same or different is relative to whether it is considered as a single river or as a collection of water.

What is at issue here is whether or not Heraclitus wants to distinguish the way opposites are usually perceived from the way they actually are. His interest in latent structure, his contempt for the mental habits of "most people" and for their lack of understanding, suggest that the distinction is important for him. A further "everyday" remark is relevant here.

> Sea: purest and most polluted water, for fish drinkable and life-sustaining, for people undrinkable and death-bringing (B61).

Here the manifest effects of seawater are relative to the drinker. But, from that fact, Heraclitus explicitly infers that the sea is, simultaneously without qualification, both "purest" and "most polluted." This supports a reading on which the observable relativities of "perception" or "valuation" are used by Heraclitus as evidence for a *nonrelative* copresence of opposites.[14] It remains to be seen, though, just what that might mean, and whether it does not collapse into self-contradiction.

3.3. Next, the generalisation. By piling up everyday examples, as we have seen, Heraclitus draws attention to the unity-in-opposites pattern. A sage might have left matters there, leaving the audience to draw their own conclusions. Heraclitus lives up to the standards he has set himself by his own appeal to the force of reason: he offers his own explicit statement in general terms of what he takes to be essential in the pattern he has noted.

> They do not understand how the diverging agrees with itself: a structure turning back on itself [*palintropos harmoniê*], such as that of the bow or of the lyre (B51).

The evidence so far suggests three theses:

(1) *The unity is more fundamental than the opposites.* The programmatic declaration, in connection with the *logos* (cf. section 2), that "all things are one" (B50), already suggests that Heraclitus harbours monistic ambitions. In revealing his ultimate description of the pattern as a *harmoniê* or "unified structure,"[15] and in presenting the bow and the lyre as everyday examples of such structure, Heraclitus focuses attention on the underlying unity, and on the way in which it incorporates and manifests the opposites.

(2) *The opposites are essential features of the unity.* In whatever way the opposites are present in the unity, what matters is that their presence is of the essence of the unity. The unity could not be what it is without them. Both the word *harmoniê* and the bow and lyre examples point to the notion of something constituted by a *functional* unity. The functioning demands that this unity "turn back on itself" in some way; the turning back, and therefore the opposites that are manifested in the turning back, are essential features. (In the case of the bow, the turning back lies in the movement of the parts, both relative to one another and to their own previous movements, when the bow is used. In the case of the lyre, the turning back may be that of the vibrating strings, or of the up-and-down movement of the melody, or both.)

(3) *The manifestation of the opposites involves a process, in which the unity performs its essential function.* This holds for the examples

of the bow and lyre. In general, the words "diverging" and "turning back" imply at least movement,[16] while *harmoniê* itself suggests a built-in teleology (see n.13).

3.4. Various objections can be made to a reading of this kind. First of all, it must be admitted that the senses in which the unity is "more fundamental" than the opposites, and the opposites are "essential" to the unity, have been left indeterminate. Heraclitus had no ready-made logical toolkit and vocabulary at his disposal. On the kind of reading that is being worked out here, he saw the need for something like the notions of *essence* and of *ontological priority* and responded to the need by providing (a) everyday examples of what he meant, and (b) words drawn from the everyday vocabulary, but transfigured into something like technical terms by the use he made of them. The interpreter of Heraclitus must try to gather as much of his intentions as is possible from his surviving words, and to make them comprehensible in modern terminology, without importing into the interpretation assumptions and problems that were absent from his mind.

Next to the objection of indeterminacy is the objection of incoherence or self-contradiction. How can the opposites be essential features of the unity without being copresent in it in a self-contradictory way? To recur to the example of seawater: to say at the same time both that the sea is "most pure" and that it is "most polluted" is to contradict oneself, since genuine opposites are mutually exclusive. On this ground, Aristotle (*Metaph.* IV.7 1012a24-26) concluded that Heraclitus must inevitably fall foul of the principle of Non-Contradiction, and therefore collapse into incoherence.

The Aristotelian objection is crucial. The way to meet it is shown by the statement about seawater. For that makes one thing clear: Heraclitus does not wish to say that the presence of purity means that the sea is pure in its manifest effects for all animals all the time. Neither does the presence of pollution mean that the sea is polluted in its manifest effects for all animals all the time. So it is necessary to distinguish between the *presence* of the opposites in a unity, and their *manifestation* in it. We have been prepared for this distinction, by the observation about the importance of latent structure.

The presence of the opposites in a unity is therefore, to borrow Aristotelian terminology, a matter of *potentiality*. It belongs to the essence of seawater, for example, that it has both the potentiality to be life-sustaining and the potentiality to be death-bringing. So a thing's very being may require the coexistence within it of diametrically opposed potentialities, an "ambivalence of essence."

This thought offers a solution to the debate between monism and pluralism: namely, that unity-in-opposites shows that the dichotomy is not exhaustive. That this was part of Heraclitus' motivation is confirmed by a key passage of Plato (*Soph.* 242d7-e4):

> [Heraclitus and Empedocles] realised that it is safer to weave together both [monism and pluralism] and to say that what is, is both one and many, and is held together by enmity and friendship; for "diverging is always converging" [says Heraclitus], but [Empedocles] relaxed the demand that that should always be so ...

If Heraclitus was indeed thinking along such lines, we expect him to say more about the way in which the potentialities manifest themselves. Point (3) of the present interpretation claims that this is done by means of a process unfolding in time. It may be objected that many of the everyday remarks do not involve any process in time, yet the opposites are still manifest. For example, we can see at one glance that a road is both an uphill road and a downhill one. And yet, neither the uphill-ness nor the downhill-ness are fully manifested until someone actually travels along the road. They may be simultaneously manifested to different travellers, or successively manifested to the same traveller; in either case, there are two distinct processes.[17] (The very word *hodos*, "road," also means "journey"; many other words used by Heraclitus show an analogous doubling of sense (see section 4).)

The central role of processes becomes even more obvious when Heraclitus applies the unity-in-opposites to cosmology and psychology. Here, the opposites are clearly not just potentialities but contending powers. The unity's "functioning" also becomes more than mere schematism: we find that the unity unites, controls, and gives meaning to the opposites.

4. THE COSMOS AS PROCESS

4.1. Heraclitus' cosmology cannot be understood in isolation from the rest of his thinking. It is dependent on unity-in-opposites; it leads on, in turn, to psychology and theology.

No god and no human being made this cosmos, but it was always and is and will be an ever-living fire, getting kindled in measures and getting quenched in measures (B30).

It is natural to think of the "ever-living fire" as a process. If so, then the cosmic constituents too – the familiar "world masses": earth, sea, air, and celestial fire – will be stages of the process; for they are "turnings of fire" (B31). "Turnings," like many other nouns in Heraclitus, is ambiguous as between process and product. Likewise, with the same ambiguity in "exchange":

All things are an exchange for fire and fire for all things, as gold is for goods and goods for gold (B90).

This primacy of process in the observable world is compatible with later testimony about a theory of "flux." Both Plato (*Crat.* 402a4-11, *Tht.* 152d2-e9) and Aristotle (*Topics* I.11 104b21-22; *De caelo* III.1 298b29-33) report that Heraclitus held that "the whole universe is in flux like a river" or that "all is in flux" or "in progression" or "in change." Embedded in this testimony is a story about the self-styled "Heraclitean" Cratylus, a philosopher of the later fifth century. Cratylus denied the possibility of any kind of sameness through time. To make his point, he foisted on to Heraclitus the remark that "you could not step twice into the same river" (B91a); apparently for the sake of trumping it with his own claim that one could not even step *once* into the same river (Aristotle, *Metaph.* IV.5 1010a10-15).

Cratylus' version of the sentence about rivers must be rejected as un-Heraclitean. The rest of Plato's and Aristotle's testimony can be accepted: they do not attribute to him the extreme views of Cratylus.[18] They show that, for him, process is the basic form of existence in the *observable* world; although something, not directly observable, persists throughout:

[Heraclitus says] that while other things are in process of becoming and flux, and none exists in a well-defined way, one thing alone persists as a substrate, of which all these [other] things are the natural reshapings (*De caelo* III.1 298b29-32).[19]

4.2. Not "the world is everything that is the case," but "the observable world is everything that is coming to be the case" might then have been Heraclitus' slogan. Space does not permit a discussion of Heraclitus' cosmology. The following is a summary of a possible view.[20] The overall cosmic process, "fire," was subdivided into the opposed episodes of "kindling" and "quenching." These in turn were subdivided into two subprocesses: one of "warming" and "drying," and one of "cooling" and "moistening." This made room for the four classical cosmic opposites (hot, cold, wet, and dry) and for the four world masses constructed from pairs of the opposites (earth = cold and dry, sea = cold and wet, and so on). All processes repeated with multiple periodicity, accounting for the day-night cycle, the annual cycle, and one or two cycles with longer periods. At some point in the longest cycle, the entire cosmos was in a fiery phase (at the extreme of hot and dry).

Besides unity-in-opposites, a further structural principle is evident. Heraclitus insists on the preservation of fixed "measures" or "proportions" in the processes.

> ... being kindled in measures and being quenched in measures (B30, part).
> All things are an exchange for fire, and fire for all things, as goods are for gold and gold for goods (B90).
> ... [sea] is measured out in the same proportion as was previously (B31; part).

Gold's use as a medium of exchange depends on the existence of a (more or less) fixed exchange rate; that means a constant proportion between quantities of gold and quantities of goods in the exchanges. Hence a "conservation principle" is valid throughout all cosmic changes: a certain constant amount of "fire equivalent" is preserved. This is a first example in Heraclitus of a principle of lawlikeness (cf. section 6) as a constraint on the course of cosmic processes.

4.3. The theory of the observable cosmos, as so far reconstructed, obeys the principles of Xenophanean empiricism. It introduces into the observable world no new entities that are not actually observed: the processes and cycles mentioned are all familiar or deducible from ordinary experience. It gives full weight to sense appearances: the sun is indeed, as it looks to be, "the width of a human foot" (B3). And it excludes speculation about what is wholly beyond human experience: the question of what might lie beyond our cosmos is not even raised.

And yet, to the extent that it stays close to the observable world, the theory cannot be a complete example of unity-in-opposites. The underlying structure should be at least partly latent, and not itself a process. So the "ever-living fire" cannot itself be the ultimate unity that ensures that "all things are one." It must be the manifestation, the activity of something else.

> God: day night, winter summer, war peace, plenty famine; but it becomes of another kind, as (fire), when it is mingled with incense, is named according to the savour of each (B67).

Here Heraclitus corrects the mistaken view of Hesiod (B57). Day and night are "one thing," not two separate things. The analogy of the altar fire, the centre of the ritual process, on which different kinds of incense were successively burnt, shows that the ordinary naming of things is deceptive. Sniffing the smoke, the bystanders say (for example) "that's frankincense"; what they ought to say is: "that's fire mixed with frankincense." So too one should speak, strictly, not of "day" and "night," but of "god in diurnal state" and "god in nocturnal state." (The opposites "war-peace" and "plenty-famine" probably refer to longer-term cosmic cycles.) Given the importance Heraclitus attaches to language, it is no surprise that he finds ordinary ways of speaking in need of reform.

But who or what is this "god" (*theos*)? As implied by the word, something that is alive (its activity is the ever-living fire), intelligent, purposive, and controlling: "Thunderbolt steers all things" (B64). Plato's and Aristotle's testimony (cited in section 4.1) points in the same direction. The introduction of a living and intelligent being as the latent unity adds a further level of complexity. Heraclitus' theory of "soul" must next be considered.

5. THE THEORY OF SOUL

5.1. Heraclitus operates with an untraditional concept of soul (*psychê*).[21] In Homer, the soul is of no importance during life; it leaves the body at death, to carry what is left of the person's individuality to a shadowy existence in Hades. For Heraclitus, it is clear that during life the soul is the carrier of personal identity and character, and the organising centre of intelligence and action. It is what the person really is; the theory of soul is the theory of human nature.

Not surprisingly, the soul is identified as the underlying unity in a complex unity-in-opposites structure. So it should manifest itself in processes: presumably one of living, and a contrary one of dying. There should be physical constituents as phases of these processes, corresponding to earth, water, and so on. There should also be subprocesses, corresponding to the two physical dimensions, hot-cold and wet-dry. The evidence confirms some of this:

Dry light-beam is soul at its wisest and best (B118).
It is death to souls to become moist (B77).[22]

The dry-wet dimension accounts for intelligence and its opposite: a drunk man's lack of knowledge and awareness is due to the fact that "his soul is moist" (B117). The ability to act effectively is also connected with dryness in this remark; and "soul ... at its best (*aristê*)" also suggests a soul *in action* (when *aristê* is taken with its traditional associations of active male excellence). As for the hot-cold dimension in relation to souls, the very word *psychê* suggests something not hot (it is naturally etymologised from the verb *psychein*, "cool," "breathe"); and a "dry light-beam" is presumably clearest when neither hot nor cold. To confirm this, heat is associated with a bad quality:

Arrogance needs to be quenched more than wildfire (B43).

5.2. Dying is the natural process opposed to living. The word *thanatos* (death), most often refers, not to the state of being dead but to the process or event of dying. For this reason Heraclitus can identify it with "becoming moist." For a soul this must mean increasingly poor functioning both in mind and action. But there can be no permanent state of death; to be dead can be but a momentary phase at an extreme point of the cycle.

It is the same that is present as living and dead, as waking and sleeping, as young and old; for these by change of state become those, and those by change of state become these (B88).

This alternate "living" and "dying" of souls can only partly correspond to living and dying in the usual sense. (The secondary cycle of waking and sleeping, with dreams, introduces further complications.) For Heraclitus, the natural decline in mind and body after the prime of life will already count as dying. By contrast, a violent death in one's prime will not count as dying at all. The soul, though separated from the body, will be in its best state. Some evidence suggests, cryptically, that death in battle, in particular, was rewarded by a place of honour for the soul outside the body, perhaps as a star.[23] In all cases, the mere corpse of a human being (the body without the soul) is valueless:

Corpses are more fit to be thrown away than dung (B96).

5.3. If souls by nature live and die, in the new senses, alternately, then they may be described both as "mortal," being always subject to dying, and "immortal," being always able to return to life. This gives Heraclitus a new, piquant case of unity-in-opposites:

> Immortals are mortals, mortals are immortals, living the others' death, dying the others' life (B62).

This is a first suggestion (cf. section 6) that the difference between the gods and humanity, traditionally almost unbridgeable, is for Heraclitus inessential. Souls are of their own nature both mortal and immortal. Whether they exist in manifest shape as human beings, or as something like traditional gods, may well be a matter of chance and of their momentary position in the cycle of living and dying. (Heraclitus' remarks on traditional Greek religion are, as might be expected, cryptically ambivalent.) Other degraded forms of being, like the traditional Hades, may also occur for souls in a bad state. The cryptic statement that "souls have the sense of smell in Hades" (B98) may indicate some kind of minimal sensory existence.

5.4. If the soul in its best state is intelligent and rational, why do most people fail even to try to understand things? Are their souls not in the best possible state, or do they fail to use their capacities? An element of choice, at least, comes into the way the soul behaves in this life.

> The best choose one thing instead of all else: the ever-flowing renown of mortals; but the many are glutted like cattle (B29).
> It is character [*êthos*] that is a person's *daimôn* (B119).

The word *êthos* has etymologically the suggestion of "habit," and descriptively picks out what is *characteristic*. It must not be equated with *physis* (nature or essence). The thought that a person's habits and character form one another reciprocally is found in archaic Greece (Theognis 31–36). This makes superfluous the popular fatalistic belief, that the quality of one's life was determined by one's allotted individual *daimôn*. Rather, the divine aspect of each person is manifested in and as character.[24]

Since individual choices, in an Aristotelian way, both proceed from and determine the character and state of the soul, an explanation can be given for the general failure of human intelligence.

Human character [*êthos*] does not have understanding, but divine character does (B78).
A man is called "infant" [*nêpios*: literally, "wordless"] by a *daimôn*, just as a child is by a man (B79).

Here again we need not read in an unbridgeable gulf between human and divine *natures*. It is a matter of character not of nature; and the child-man analogy implies that a man can "grow up" to become a *daimôn*. That human nature is perfectly capable of achieving real understanding is shown, not only by Heraclitus' claims on behalf of his own thinking, but also by explicit statement:

All share the capacity to understand (B113).
All human beings share in the capacity to know themselves and to be of sound mind (B116).

Why, then, are human beings so prone to form bad habits in thinking and living, and to make bad choices? There are no direct indications of Heraclitus' answer, but the struggle between good and bad in any individual must presumably be connected with, and isomorphic to, its cosmic counterpart.[25]

5.5. The intelligent soul will want to understand everything: including itself. Heraclitus tells us: "I looked for myself" (B101). This suggests introspection, in which the mind has privileged and direct access to itself. Whatever Heraclitus' preferred method of looking for himself, he is aware of the paradoxical and elusive nature of the quest.

The bounds of soul you would not find by going about, though you
travelled over every road; so deep a *logos* does it have (B45).
To the soul belongs a *logos* that increases itself (B115).

The "bounds" are spatial only within the metaphor of "travelling." They are *logical* limits, that "mark off" the nature of the soul from that of other things. Correspondingly, the *logos* of the soul is the true, rational account of the soul, but it can also be understood as the account given *by* the soul. This points up the paradox that the soul is here talking about itself. The regresses of reflexivity now intrude. The soul must talk about itself and therefore about its own talk about itself, and so on. The story of the soul is an unlimitedly self-increasing one.

6. ULTIMATE QUESTIONS

6.1. Unity-in-opposites gives Heraclitus a theory of the cosmos and one of the soul. But did he aim at overall theoretical unity and closure?[26] (1) Is the individual soul not merely analogous to, but essentially the same as, the latent unity, the god or ever-living fire of the cosmos? (2) Is unity-in-opposites meant to extend to all opposites of any importance? (3) Is there any other principle as fundamental as unity-in-opposites, or anything else more basic than the cosmic unity?

On question (1), there are signs (though ambiguous and not supported by direct statement) that individual souls are, indeed, fragments of the cosmic unity.[27] This would be a theoretically satisfying equation. The nature, purpose, and destiny of a human being can then be understood in cosmic terms.

On the other questions too, certainty is hardly possible. Heraclitus' manifesto statement that "all things are one" (B50) justifies an assumption that he aimed at maximal theoretical unity, but, as to just how he tried to achieve it, the evidence is incomplete. This section offers a review of such further evidence as there is on such ultimate questions and some consequent suggestions about the overall shape of Heraclitus' system.

6.2. Unity-in-opposites is a unified conception that overcomes the apparently unbridgeable oppositions of monism and pluralism. It is therefore an example of itself. Heraclitus seems to be aware of this curious state of affairs:

> Comprehendings: wholes and not wholes; in unison, not in unison; and from all things one and from one all things (B10).[28]

This remark uses the usual unity-in-opposites pattern in talking about "comprehendings" (*syllapsies*), with the usual process-product ambiguity: the products or the processes both of "taking together" and "understanding." These must be cases of unity-in-opposites, which considered abstractly exemplify the very same pattern.

This reading suggests why unity-in-opposites is fundamental and central. First, it is a phenomenon so all-embracing that it even embraces itself. Next, it is necessarily the pattern that structures thought and language, because it is the pattern of understanding. Any sentence has many different words with syntactic functions "moving different ways," but a single meaning making it a unity. The *logos*, whatever it is, is something that is expressible only in language and intelligible only because it is so expressible. The structure of language and thought is necessarily also the structure of reality: this is the conclusion to which Heraclitus seems to be pointing.

6.3. Unity-in-opposites, as displayed in cosmos and soul, exemplifies another higher-level opposition: that between conflict and law.

If opposites such as hot and cold are forces, genuinely opposed, there must be real conflict between them:

> Heraclitus rebukes the poet [Homer] who said: "Would that strife might perish from among gods and men!"; for there would be no fitted structure (*harmonia*) if there were no high-pitched and low-pitched, nor would there be animals without the opposites male and female (Aristotle, *Eudemian ethics* VII.1 1235a 25-29).
>
> War is father of all, king of all: some it shows as gods, some as human; some it makes slaves and some free (B53).

But if the processes are to be intelligible, they must also be lawlike (cf. section 2.4 on the analogy of the *logos* with law in a city). Heraclitus not only emphasises both opposed aspects, but he also proclaims that they constitute a unity.

> Sun will *not* overstep measures: otherwise, the Furies [*Erinyes*], helpers of justice, will find him out (B94).
>
> But one must know that war is the same for all [*xynon*], and that justice is strife, and that all things happen according to strife and necessity (B80).

How, then, can the cosmic process constitute both strife and justice at one and the same time? The Heraclitean solution is perhaps preserved in an unusually enigmatic remark:[29]

Everlasting [*Aiôn*] is a child at play, playing draughts:[30] to a child belongs the kingdom (B52).

The child is a boy playing a board game for two players; no opponent is mentioned, so the assumption must be that the boy is playing both sides. This can still be a free and genuine conflict, in which skill is exercised and sharpened. It is lawlike in procedure: the rules (which are freely accepted by the players, not imposed from outside) define the game and are impartial as between the sides. It is lawlike in outcome since, if each side plays equally well, it will win equally often in the long run – though the outcome of any one game will not be predictable. In the short-term there are (as gamblers know) alternating runs of luck on one side and the other. True to his habits of thought, Heraclitus seeks to show, by a model drawn from everyday experience, that strife and justice can coexist, interdependently, without becoming denatured.[31]

Here, if anywhere, we seem to glimpse where Heraclitus located the meaning of life for the individual: in participation in the inner and the cosmic struggle.

6.4. To the analogy of the board game, it can be objected that the boy who plays both sides has two plans in his head, not a single unified plan. For the underlying unity just to manifest itself alternately in opposites is not enough. There must also be an underlying unity of purpose, as implied by the talk of "steering" and of a plan. In connection with these, Heraclitus speaks cryptically of "the wise":

One thing only is wise, being skilled in the plan, how all things are steered through all (B41).

Of all whose words I have heard, none has got so far as to recognise what is wise, distinct from everything (B108).

The one only wise is unwilling and willing to be called by the name *Zên* (B32).

The wise (*to sophon*), a neuter adjective used as a substantive, might be taken abstractly as "wisdom," or concretely as "the (only) wise thing." The word *sophos* was not, at this time, exclusively intellectual in application, being used for anyone with any specialized skill. In B41, the skill (knowing how) aspect is prominent, in the art of cosmic steersmanship and in the verb *epistasthai* (understand, be skilled in). The intellectual or strategic aspect (knowing that/why) appears in the mention of a "plan" or "piece of knowledge" (*gnômên*). The function of the wise is to understand the cosmic plan and to get it put into action.

One cannot straightforwardly identify the wise with the cosmic god. It is not simply the same as *Zên* (a form of *Zeus*, implying an etymology from *zên*, "live"). It is "distinct from everything," and unique. At the same time, it consists in understanding, which includes both knowing how and knowing that, and apparently might be acquired even by human minds.

We must then take the wise as something that stands above and apart from both cosmic opposites and cosmic unity, yet manifests itself both in the cosmic god and in individual souls. "It is characteristic of a god to have understanding" – but not part of its *nature*. Craftsmanship has to be learned and refreshed by practice, and the craft is logically prior to the craftsman.

7. CONCLUSION: THE PAST AND FUTURE OF HERACLITUS

7.1. The response to Heraclitus has always been mixed. As a philosophical pioneer, whose insights outrun his technical equipment, he has suffered the predictable fate of being misunderstood. The loss of his book at the end of the ancient world caused his long eclipse, which was aggravated by the long domination of the history of ancient philosophy by Platonic and Aristotelian texts and assumptions. (Both Plato and Aristotle were more indebted to Heraclitus than they admitted; both treated him with condescension). Against these obstacles, the canonisation of Heraclitus by Stoics and some early Christian writers hardly helped.[32] It ensured the survival of precious information but dipped it in an alien dye, adding an extra layer of misunderstanding.

The revival of a truer appreciation needed a combination of improved historical and philosophical understanding. It began in Germany at the end of the 18th century: Schleiermacher was the father (and Hegel the godfather) of renewed Heraclitean scholarship.[33] Since Schleiermacher's work, there has been real, if intermittent, progress on the scholarly front. What is more, Heraclitus has become widely-known and appreciated, even if, as always, his influence is elusive.

7.2. What are the prospects for Heraclitus in the third millennium? Much basic scholarly work remains to be done. For example, study of the reception of Heraclitus in later antiquity has made only limited progress, so far.[34] Above all, there is still a need for the systematic application of textual, linguistic, literary, and doxographical expertise to the entirety of the fragments and testimony.[35]

Even as scholarship in the narrow sense progresses, there remain perennial questions of interpretation. Heraclitus is, recognisably, a philosophically active mind. He will always be misunderstood by those who are deaf to the call of philosophy, while philosophers will always want to annex him to their own particular concerns.

The present chapter has aimed (1) to take him seriously as a pioneering philosopher; and (2) to treat every part of his thought as part of a whole and not in isolation. (The interpreter has to construct Heraclitus as a Heraclitean unity-in-opposites, with the systematic and the aporetic as his opposed aspects.) A third task, to locate him in the intellectual context of his own time, is too specialized to be attempted here, though required for any full account of Heraclitus.[36]

7.3. Heraclitus' claim to the continued interest of philosophers is that he is a pioneer of philosophical and scientific thoughts and of logical devices. And behind what he actually expresses, there seem to lie certain ideas that determine his thinking. Among these are: that reality must be something that can be lived and understood from the inside; and that the structure of language is the structure of thought, and therefore of the reality that thought describes. Whether Heraclitus himself could or would have formulated these ideas in such terms, is quite uncertain. What the tone and the mastery of his fragmentary work does put beyond doubt, is that he was already, in Ryle's phrase, a self-moving philosopher.[37]

NOTES

1 See Most in this volume p. 357.

2 Polemic explicit and implicit against: Homer (DK 22 B42; Aristotle *Eudemian ethics* VII.1 1235a25-28 = A22; B94); Hesiod (B40, 57, 67); Archilochus (B17, 42); "singers of the people" (B104). Against popular and traditional opinions: B2, 17, 20(?), 27, 28, 29, 47, 56, 70, 74, 86, 104, 110, 121, 127(?), 128(?).

3 See in this volume Long, p. 9, and Most, p. 338.

4 Aristotle, *Metaph.* I.3 984a5-8; but both Aristotle (*Metaph.* IV.7 1012a24-26) and Plato (*Soph.* 242c4-e3) are aware of other aspects (logical, ontological) of Heraclitus.

5 Thales was mentioned (B38); Anaximander implicitly corrected (B80).

6 On the empiricism of Xenophanes and Hecataeus, see Fränkel [97] 325–49; Hussey [246] 17–28; Lesher [189] 149–86; on Heraclitus' epistemology, Hussey [245] 33–42; Lesher [250] and in this volume, p. 232.

7 On Heraclitus' linguistic devices and their intention, see (e.g.) Hölscher [153] 136–41 = Mourelatos [155] 229–34; Kahn [232] 87–95; Hussey [245] 52–57.

8 *Physis* in early usage is tied closely to the verb *einai* and means "what something really is": see D. Holwerda, *Commentatio de Vocis quae est Φύσις Vi atque Usu praesertim in Graecitate Aristotele anteriore* (Groningen, 1955).

9 On early uses of the word *logos*, see Guthrie [15] 420–24 (a convenient survey, but it neglects the evidence of derivative words); Verdenius [264].

10 On *logos* in Heraclitus: Kirk [233] 32–71; Verdenius [264]; Kahn [232] 92–95; Dilcher [239] 27–52; a minimalist view in West [136] 124–29.

11 Mere opinions are also described as "what [merely] seems" (B28), as products of conjecture (B47), as stories told to children (B74), as toys for people's amusement (B70), as (?) the barking of dogs at strangers (B97).

12 On unity-in-opposites in Heraclitus, a variety of opinions can be sampled in: Kirk [233] 166–201; Emlyn-Jones [240]; Kahn [232] 185–204; Mackenzie [254].

13 So too Aristotle (*Topics* VIII.5 159b30-33), giving "good and bad are the same thing" as a thesis of Heraclitus, interprets it as meaning that the same thing is simultaneously both good and bad.

14 On B102, relevant here if genuine, see n.29.

15 The verb *harmozein* (fit together) implies a purposive mutual adjustment of components to produce a unity. The noun *harmoniê*, derived from the verb, denotes the result of such a process. It had also a specialized musical sense, which is probably also in play in B51. It should not be translated as "harmony" (the associations are misleading and the musical sense different).

16 The ancient variant reading *palintonos* (back-stretching) implies static tension, not dynamic process, at the core of Heraclitus' vision of the world, but it is less well-attested, as well as less in tune with the evidence in total.

17 Plato at *Soph.* 242c-e is concerned with ontological foundations only; it is therefore understandable that he says nothing about processes.

18 While Plato in the *Cratylus* seems to conflate the views of Cratylus and Heraclitus, his full examination of the extreme flux doctrines (*Tht.*, esp.

151d-160e, 179c-183c) associates them with Heraclitus only in vague terms.

19 Cf. Plato *Crat.* 412d2-8. In a different sense, the underlying unity can also be said to be "in flux": Aristotle *De an.* I.2 405a25-27, cf. Plato *Tht.* 153a7-10.

20 On Heraclitus' cosmology: Reinhardt [258] 41–71; Kirk [233] 306–61; Kahn [232] 132–59; Wiggins [266] 1–32; Dilcher [239] 53–66.

21 On Heraclitus on the soul: Kirk [248]; Nussbaum [256]; Kahn [232] 241–60; Robb [259]; Hussey [247]; Schofield [261]; Laks (Chapter 12 in this volume).

22 Alternative versions (B36, 76) of this remark integrate the soul into a sequence of physical changes, but this looks like a later, Stoicising reconstruction.

23 B24 (cf. B136?) and B25; also later doxographical reports in A15 and A17.

24 I am indebted for this point (and in section 5.3 on Heraclitus and Greek religion) to the remarks and unpublished work of Mantas Adomenas.

25 There are hints of a treatment in physical terms of the passions and pathology of the soul: on arrogance as "wildfire," B43; on self-delusion, B46; on the power of desire (*thymos*), B85; on sensual self-indulgence, which makes souls moist, B77, cf. B117.

26 On the questions discussed in this section: Kahn [232] 204–11, 276–87; Hussey [245] 42–52.

27 The strongest explicit testimony is Aristotle *De an.* I.2 405a25-26.

28 There are uncertainties about the text. The first word may be "fittings-together" (*synapsies*); it is not certain that the other clauses all belong together.

29 If we may set aside the putative solution offered by B102:

> To God all things are fine and good and just: but human beings have supposed some things to be just, others to be unjust.

There are philological grounds for doubting the authenticity of this remark, which is also out of line with Heraclitus' treatment of opposites (see section 3).

30 The translation "draughts" is conventional; the board game in question (*pessoi*) was closer to backgammon.

31 B124 (on the interdependence of large-scale order and small-scale chaos?) may also be relevant.

32 "Those who have lived with the *logos* are Christians, even though reputed godless, such as were, among the Greeks, Socrates and Heraclitus and those like them" (Justin, *Apol.* 46.3).

33 Schleiermacher [260]; Hegel [22] (vol.1, 279: "There is no proposition of Heraclitus which I have not adopted in my Logic"). The next substantial

contributions were Jakob Bernays' early work (1848-54 = Bernays [237] 1–106), and Ferdinand Lassalle's monograph of 1858 (Lassalle [249]).

34 There is still, for example, no comprehensive study of Heraclitus and the Stoics (but see Long [251]; Dilcher [239] 177-200). On Heraclitus in the Christian writer Hippolytus (an important source), see especially Mansfeld [51]; also Mueller [53] (a review of, and corrective to, Osborne [52]).

35 On the new evidence in the papyrus found at Derveni in 1962, see now Sider [262], Tsantsanoglou [263], which contain the best available readings of the relevant part of the text.

36 This context, besides Homer, Hesiod, and the Ionian natural philosophers, may include the Ancient Near East, Judaism of the exile period, and early Zoroastrianism.

37 I am indebted to all those who over the years have helped me in understanding Heraclitus, and in particular to Mantas Adomenas, Roman Dilcher, and David Wiggins.

DAVID SEDLEY

6 Parmenides and Melissus

Parmenides and Melissus were bracketed in antiquity as the two great exponents of the Eleatic world-view which denies change and plurality.[1] In modern times their treatment has been curiously unequal. Too much has been written on Parmenides – albeit the greater thinker of the two – too little on Melissus. Too much has been said about Parmenides' use of the verb "be," while too little has been said about his detailed arguments for the individual characteristics of what-is. However, neither these nor other anomalies should disguise the immense wealth of scholarship that has furthered the reconstruction of their Eleaticism.

PARMENIDES

Around 150 lines of Parmenides' hexameter poem, written in the early- to mid-fifth century, have been recovered, most belonging to its first part. His densely metaphorical diction is replete with Homeric echoes, and presents the further difficulty of having to use the very language of change and plurality that it aims ultimately to outlaw. These are among the many aspects to which it will be impossible to do justice in the present chapter.

The poem opens with an allegorical description of Parmenides' journey to the House of Night, mythologically located where the paths of day and night join.[2] This symbolizes Parmenides' intellectual journey of distancing himself from a phenomenal world in which (as the second half of his poem will explain) light and night alternate to produce the illusion of plurality and change.[3]

There a goddess addresses him, promising to expound "the unshaken mind of well-rounded truth," and the unreliable "opinions of mortals." These correspond to the two halves of the poem, respectively the "Way of Truth" and the "Way of Seeming." The entire philosophical exposition is delivered by the goddess herself. She may be taken to represent the god's-eye view of being that Parmenides' arguments have enabled him to attain for himself. There is no question of her discourse being mere divine revelation: every step towards the truth is hard won by argument.

The Way of Truth

"Come now, I will tell you (and see that you attend to the story you hear) which are the only paths of inquiry that can be thought of" (DK 28 B2.1-2). The goddess' argument proceeds as follows.

(1) She offers a choice between two paths: "Necessarily (it) is" and "Necessarily (it) is not" (B2.3-5).
(2) She argues against the latter, and hence indirectly in favour of the former.
(3) She warns Parmenides against a third path (B6.4–9), a "back-turning" one representing ordinary human acceptance of a variable world – the path of know-nothing "two-headed" mortals, who somehow manage to conflate being and not-being.

If we are to see what this is all about, some preliminaries must be clarified. First, "(It) is" is conveyed by the single Greek verb *esti.* Greek does not require that the subject always be expressed: hence *esti,* unlike English "is," functions as a grammatically complete sentence. As for why no subject is made explicit, the safest answer is that at this stage we are still investigating the logical behaviour of the verb "to be." Only in the light of that investigation will we be able to answer the question what can stand as the subject of "is." Thus, identifying the proper subject of the verb "to be" is the final goal of the Way of Truth, not to be prejudged at the outset.

Second, what does "is" mean here? It has become traditional to offer a choice between at least the following: an existential or complete sense, "...exists"; a copulative or incomplete sense, "... is... "; a veridical sense, "... is the case" or perhaps "... really *is*... "; and a fused sense, combining some or all of these. The main argument that lies ahead may seem to rely on the existential sense, but the third path, that of two-headed mortals who conflate being and not-being, represents acceptance of a variable world, and therefore should include ordinary empirical predications within its scope, for example, that the sky *is* blue and *is not* grey, that this animal *is* alive one day but *is not* alive the next: and these are incomplete uses of the verb.

The following, however, may be a safer way to proceed. It is widely recognized that the fundamental sense of "be" in Greek is incomplete, to be *something.* Often this something is made explicit: Fido is a dog, is the dog over there, is hungry, and so on. On other occasions it is left unspecified: Fido is. Modern readers may wish to call this latter a different sense of "is," equivalent to "exists," but to a Greek ear it is just a nonspecific use of the fundamental sense. To say, existentially, "Fido is" is merely to say that he is something (unspecified).

To read Parmenides' poem, we must cling to this fundamental sense of "be." Ordinary people consider the same things both to be and not to be, because, for example, the sky seems to them to be blue and not to be grey. Why should Parmenides object? Because he is wedded to a principle later expressed as, "The choice about these things lies in the following: (it) is, or (it) is not" (B8.15-16). This amounts to what I shall call Parmenides' Law 1:

> Law 1. There are no half-truths. No proposition is both true and false. No question can be coherently answered "Yes and no."

Asked whether the sky *is*, a two-headed mortal is committed to the "Yes and no" answer that it both is (e.g., blue) and is not (e.g., grey). All ordinary human beliefs about change and plurality will on examination turn out to imply the same ambivalence about a thing's being.

As for Parmenides himself, the reason why his own primary use of "be" in the Way of Truth looks existential is simply that, by Law 1, he can only contemplate total being or total not-being. To specify *what* a thing is, as mortals do, is implicitly also to specify what it is not, and thus to fall foul of Law 1. It is probably harmless for us to gloss Parmenidean being as existence (and for convenience I shall do so), so long as we do not forget that it arises as a logically sanitized case of ordinary Greek being, namely being something.

It is probably this sanitization that Parmenides means to convey by presenting the first two paths as "Necessarily (it) is" and "Necessarily (it) is not." Human viewpoints attribute being to things contingently and unstably, so that what-is can also not-be. In view of Law 1, this human outlook does not even start out as a formal possibility, and hence the goddess does not even initially list it among the conceivable paths, which she limits to propositions about *necessary* being and not-being. She later adds the contingent third path, not because it is even a formal possibility, but because despite its hopeless incoherence it is what ordinary mortals actually believe.

We can now proceed to the goddess' refutation of the path "... is not." Her first argument is: "For you could not *know* that-which-is-not (it can't be done), nor *speak* of it" (B2.7-8). How does this work? We may take it that to reject "... is not" is tantamount to showing that this negated verb could never be supplied with a subject. And how do you supply a verb with a subject? Either (i) by thinking of that subject, or (ii) by naming it. But (i) to think of something, you must, minimally, *know what it is*; whereas anything capable of standing as subject of "... is not" would not be anything at all (given Law 1), in which case, you could hardly know what it is! And (ii) by the same token, since the item in question would be nonexistent, it becomes hard to see how you could succeed in *naming* it: it simply is not there to be referred to.

Her second argument is even more condensed: "(1) What can be spoken and thought of must be. (2) For it is able to be, (3) whereas a nothing is not able to" (B6.1-2). Typically, Parmenides argues backwards: (1) is the immediate ground for his conclusion, the outlawing of "... is not" – if you want to supply "... is not" with a subject, you must either speak of that subject or think of it; however, it is then instantly disqualified as subject of "... is not," because anything you can speak or think of *must be*. The grounds for this last point are then supplied: (2) what can be spoken and thought of at least *can* be (in that it is conceivable?); but (3) a nonexistent thing ("a nothing") *cannot* be (it is inconceivable that there should exist a nonexistent thing); therefore, what can be spoken or thought of cannot be a nonexistent thing, that is, it must exist.

This is a lot of flesh to put on so skeletal an argument. But the goddess now adds "I bid you think that over" (B6.2), acknowledging that her argument needs *some* fleshing out. She has now established what I shall call Law 2:

Law 2. No proposition is true if it implies that, for any *x*, "*x* is not" is, was or will be true.

Laws 1 and 2 will ground all her subsequent arguments.

She proceeds (B6.3-9) to deride the hopelessly confused path of mortals, whose mistake is traced to their reliance on the senses. The alternative approach that she advocates involves abandoning the senses in favour of pure reason (B7).

At this point she launches into her positive account of what-is (B8.1-49). Taken literally, what-is will prove to be an everlasting, undifferentiated, motionless sphere. How is this to be understood? If the sensible world is an illusion, is she describing the reality that actually occupies the place that the sensible world just seems to occupy? Or is she describing a reality as nonspatial and nontemporal as, say, numbers are? To put it another way, how far are we meant to deliteralize the description of what-is? I offer the following reason for retaining an unashamedly spatial reading. This final stretch of the Way of Truth is full of arguments. Most commentators are disappointingly silent on their structure and content. Only if we take them in literally spatial terms, I submit, do they prove to be good arguments.

If I am right, Parmenides' goal is to reject humans' woefully perspectival view of the sphere (bounded by the sky) that constitutes their world, and to redescribe as a perfect undifferentiated unity *that very same sphere.* A familiar objection to so literal a spatial reading has long been that if what-is were a finite sphere it would be surrounded by what-is-not, that is, void, in contravention of Law 2. This objection illegitimately assumes the infinity of space. A century later Archytas still had to argue for the infinity of space,[4] and Aristotle, followed in this by a long later tradition, could deny that there is anything, even void, beyond our world. A doctrine of infinite space may have had Pythagorean support by Parmenides' day, and it certainly acquired considerable currency in the philosophy of the Ionian east, but in the west a philosopher as indebted to Parmenidean thinking as Empedocles could postulate a finite world with (apparently) no void beyond. The very idea of space as an entity that exists altogether independently of the occupying body was slow to emerge in Greek thought,[5] and without it the expectation that space should continue even beyond the limits of its own occupant would not present itself as irresistible. Provided that Parmenides' sphere is imagined from inside, like the sphere of our phenomenal world, and not from outside like a football, the need for empty space beyond need not be forced upon him.

The goddess' description of what-is starts with a list of its predicates (B8.2-4): it is (a) ungenerated and unperishing, (b) a single whole, (c), unmoving, (d) perfect (*teleion*) or bounded (*teleston*) or balanced (*atalanton*).[6] In what follows, these four appear to be proved in sequence. But first a remark about time is added, which it may be easiest to take as parenthetical, since, although supported in what follows, it receives no separate proof: "Nor *was* it, nor *will* it be, since it is now all together, one, continuous" (B8.5-6). This is perhaps to justify her exclusive use of the present tense in describing what it "is": there is nothing to be said about what it was or will be, because once we see that it is a changeless unity we will appreciate that no past or future can be distinguished from its present. Whether this makes being altogether timeless, or simply abolishes the *passage* of time, is controversial,[7] but her retention of "now" may favour the latter.

The proof of the double predicate (a), "ungenerated and unperishing," starts with the former. The two arguments against the wholesale generation of what-is are: (i) that would mean that "It is not" was previously true, contrary to Law 2 (B8.6-9); and (ii) coming from nothing, there could have been no reason for it to spring into being when it did, rather than earlier or later (9-10) – a celebrated application of the Principle of Sufficient Reason. There follows a separate argument against its *piecemeal* generation: (iii) "In the same way it must be totally or not at all,[8] and the strength of belief will never allow anything to come into being in addition to it, out of what-is-not" (11-13). That is, the generation even of a part would still defy Law 2 as effectively as wholesale generation does.

"Therefore Justice does not loosen it in her fetters and permit it either to come to be or to perish, but holds it firm" (13-15). This is the first mention of perishing in the argument, and "Justice" may represent parity of reasoning: the same arguments that eliminate generation are effective against perishing too. Strictly, however, argument (ii) cannot be reapplied to perishing: in what-is there could well be, for all we know at this stage, ample reason for its eventual destruction, for example, a terminal illness. However, arguments (i) and (iii) are easily adapted to perishing, which, whether wholesale or piecemeal, would entail "... is not" coming to be true.

The goddess now moves on to predicate (b), "a single whole." What-is is shown to be "not divided" or perhaps "not divisible" (22-25). It is perfectly continuous, with no distinct parts. Since there are no degrees of being – even limited not-being would contravene both Law 1 and Law 2 – there is nothing true of it at one point that is not equally true elsewhere. That is, it is "all alike," so that no gaps or distinctions can be found within it.

Predicate (c), "motionless," now follows (26–33). What-is is motionless in that it is "unstarting and unstopping" (i.e., presumably, it neither starts off nor comes to a halt), "since generation and perishing have been banished" (starting and stopping being, respectively, the generation and the perishing of motion). And it stays exactly where it is because "mighty necessity holds it in the bonds of a limit, which imprisons it on all sides" – that is, filling all available space up to its boundary, it has no room to move. The ground for attributing this boundary to it is then added: "For it is not proper for what-is to be unfinished: if it were, it would lack everything." Absence of a boundary would be a form of incompleteness, and hence a lack; and since, by Law 1, it cannot be both lacking and not lacking, it would be totally lacking, and therefore nonexistent.

"Motionless" here has often been interpreted as "changeless," and the limit as symbolizing "invariancy." The danger that such deliteratization faces is that of diluting the argument into the trivial "It does not change because it does not change." On the spatial reading that his language more naturally invites, Parmenides has a substantial argument. If he does also have an argument against change in general, it is the one against piecemeal generation (11-13), which could well include generation of new properties.

Particularly puzzling are lines 34-41 of B8. They seem to halt the flow, by separating the proof of predicate (c) from that of predicate (d), which follows at 42-49. Some have taken them to be somehow part of that final proof, others to be displaced from their correct position, others to be a summary of the results so far, and yet others a digression against empiricism. My own preference is for viewing this as the place where Parmenides corroborates monism, the thesis which later tradition most strongly associated with him. Before embarking on her final proof, that of the shape of what-is, the goddess must pause to demonstrate its *singularity.* She has already shown that it is not divided. But there remain three additional claimants to a share of being: (1) thought, (2) time, and (3) the plurality of ordinary empirical objects. Each is addressed in turn.

(1) "Thinking is identical to that with which thought is concerned": thought is identical to its own object, what-is. "For in what has been said" – that is, in the goddess' arguments so far – "you will not find thinking separate from being" (34-36). There has been much resistance among English-speaking scholars to attributing to Parmenides any such identification of thinking with being. Yet it is the only natural reading of B3 (of uncertain location), "For it is the same to think and to be."[9] Besides, the price of *not* identifying thinking with being is to undermine his monism, by separating the thinking subject from the object of thought, that-which-is. Parmenides does not deny that thinking happens, but since being is all that there is, he must deny that thinking is separate from being. So we must take him to hold that what thinks is, and that what is thinks. That may be why in the proem (B1.29) the goddess promised to teach Parmenides the "unshaken *mind* of well-rounded truth."[10] The conflation is not altogether surprising in a context of early Greek philosophy. Anaximander, Anaximenes, and Heraclitus had all treated their primary existent, the stuff of the universe, as divine. And Parmenides' follower Melissus, as we will see, likewise speaks about his own One as if it is a living being.

(2) "Nor is there, or will there be, time[11] over and above what-is, since Fate has bound it down to be whole and unmoved" (37-8). I suggest that its being whole (= "the whole?"), and hence spatially all-inclusive, means that there can be no external change to provide the measure of time, while its being unmoved likewise eliminates any internal measure of time.

(3) "Therefore it [i.e., what-is][12] has been named all the things which mortals have posited, believing them to be real – to come-to-be and to perish, to be and not to be, to change place, and to alter bright color" (38-41). Parmenides here shows why he need not be embarrassed by his earlier premise that whatever can be spoken and thought of must exist (B6.1). That may seem to populate his

world with a vast plurality of items – kettles, pigs, rainbows, even hobgoblins. But it now turns out that all of these names reflect inept human attempts to talk about just one thing, namely what-is, since there is nothing else to talk about.

Monism, then, is preserved. We are now ready for the final description, predicate (d): what-is is spherical. "But since there is an outermost limit, it is complete on all sides, like the mass of a well-rounded ball – equally balanced from the centre on all sides" (42-44). This certainly *sounds* like a literal geometrical description of its shape. Grammatically, "equally balanced from the centre" is said of what-is itself, not of the ball to which it is compared. Hence, the resort often adopted of taking this to be a comparison to a sphere merely in terms of perfection or uniformity looks unpromising. And it becomes even less promising if we examine the actual argument which follows (44-49):

> For it must not be any larger or smaller here than there. For (1) neither is there what-is-not, which might prevent it reaching the same distance; (2) nor is there any way that what-is could be more than what-is here and less there, since it is all immune to plundering: for equal to itself on all sides, it has equal being within its limits.

Unless someone can find a plausible metaphorical interpretation of "larger" and "smaller,"[13] one that leaves Parmenides with a real argument here, we have little choice but to take them in their literal spatial sense. What-is cannot be larger in one direction than another, that is, be asymmetrical, because nothing could make one radius shorter than another: (1) there is no not-being to foreshorten the radius; (2) there can be no thinning out to create imbalance, since, given its equal being right up to its limits, nothing is missing from it. In short, there could be no explanation for asymmetry, that is, for any shape other than the sphere.

So ends the Way of Truth. But can what-is really be geometrically spherical, without sacrificing its partlessness? Surely a sphere has distinct parts – segments, hemispheres, and so on? The answer, I think, is not that divisions *cannot* be imposed (witness the way mortals fragment reality), but that we misconstrue reality if we do impose them. In which case, the importance of its sphericity is that the sphere is the one shape which you *can* conceive as a single whole without distinction of parts: any asymmetrical shape can be grasped only by distinguishing corners, faces, ends, and the like. And our instructions from the goddess (B4, of uncertain location, but presumably soon after the proem) have been that we should not attempt to impose any spatial distinctions:

> Gaze in thought equally[14] upon absent things as firmly present. For thought will not split off that-which-is from clinging to that-which-is, whether scattered everywhere in every way through the world or gathered together.

Before leaving the Way of Truth, we should consider its argumentative structure. Once the choice of paths was complete, the goddess took us through a series of largely independent proofs demonstrating each of the predicates of what-is. Only once did the conclusion of one proof serve as the premise for another, and that was (B8.27-28) when (a) the rejection of generation and perishing was invoked among the grounds for (c) the denial of motion. Otherwise each proof was self-contained, its premises either presented as self-evident or relying on one or both Laws. This will provide a key contrast with Melissus' methodology.

However, in a puzzling fragment the goddess remarks: "It is all the same to me where I start from; for I shall come back there again" (B5). Coming back to where you started should be the hallmark of the "back-turning" path followed by mortals, and it is hard to see how the arguments of the Way of Truth could be thought to have such a structure. In particular, she could hardly have started other than with the disproof of " . . . is not," and that certainly is not where she ends up again. Some have even thought, for this reason, that the fragment belongs to the Way of Seeming, but its source, Proclus, clearly implies otherwise. A better guess is perhaps that in context "there" referred, not to the arbitrarily chosen starting point, but to what-is. She would then mean, that all arguments, wherever they may start from, will bring you back to being, because ultimately that is the only possible subject of rational discourse.[15]

My account is not fully in tune with recent appreciations of Parmenides.[16] While English-speaking scholars like Burnet and Cornford made him very much the radical cosmologist I have claimed him to be, a Germanic tradition, fuelled in the twentieth century especially by Heidegger, has recreated him as a pure metaphysician, and G.E.L. Owen, in his seminal "Eleatic questions" (1960), felt obliged to absolve him of the title "cosmologist" in order to boost his credentials as a philosopher. The present chapter, while heavily indebted to these studies, eschews so absolute a choice. Parmenides' Way of Truth is, to be sure, not a treatise on physics. Nevertheless, it can remain a contribution to the traditional cosmological debate, despite the fact that its methodology pioneers the newly emerging philosophical disciplines of metaphysics and logic. Even its most outlandish metaphysical thesis, the identification of thinking with being, finds, I have argued, a respectable place within the ancient cosmological tradition.

The Way of Seeming

We may now turn to "the opinions of mortals."The goddess sets out, unargued, an analysis of the phenomenal world in terms of two opposite "forms" or elements, called "light" and "night," the former bright, rare, and fiery, the latter dark, dense, and cold. What followed (now largely lost) set out a cosmology that included a creative goddess, a detailed description of the heavens as a set of concentric bands, an embryology, and a physiology of human cognition.

But why teach Parmenides all this? From the outset she has declared it untrustworthy (B1.30), and now in embarking on it she describes it as "deceitful," if "plausible" (B8.52, 60). Yet Parmenides must learn it "in order that no opinion of mortals may outstrip you" (51). On the face of it, she can only mean by this last remark that the cosmology will be the best of its kind, a successful competitor for the cosmological theories currently on offer. Indeed, what followed certainly was competitive: it even contained two major astronomical discoveries – that the Morning Star and Evening Star are identical, and that the moon is illuminated by the sun. But if the Way of Truth is true, cosmology must be false. So why join in the game?

The answer has something to do with arithmetic. Parmenides' major predecessors had been material monists, reducing reality to manifestations of one stuff. Parmenides' own cosmology is equally clearly dualist. So it is scarcely an accident that he moves from *one* entity in the Way of Truth to *two* in the Way of Seeming (B8.53-4):

> For they [mortals] have made up their minds to name two forms, of which they should not name one, and that is where they have gone wrong.

Despite a long-standing controversy about the meaning of this, it seems likeliest to be saying that two, although the minimum for rescuing cosmology, is one too many. Aristotle plausibly suspected that the two elements somehow corresponded to what in the Way of Truth were called what-is and what-is-not. Elemental dualism, that is, is the physical counterpart of mortals' combination of being with not-being.

Can we say whether the illicit second element, corresponding to what-is-not, is light or night? Aristotle and Theophrastus took it to be night. But their supposition may be conditioned by the too familiar symbolism whereby light represents truth and reality. Modern scholarship[17] has shown that this is not Parmenides' use of light imagery; indeed, in the proem his allegorical journey is *from* the light into the House of Night. This lends additional credibility to Karl Popper's proposal that light – the element that, *par excellence*, informs the senses – is the intruder.[18] Parmenides knew, and was perhaps the first to know, that the moon is in reality a solid sphere, its apparent changes of shape an illusion generated by the play of light. This, Popper suggests, may have inspired an analogous account of how the universe, in reality an undifferentiated sphere, is endowed with apparent variability over time and space by the intrusion of a lightlike second element.

How, then, does the cosmology complement the Way of Truth? Above all by showing how to bridge the gap between truth and cosmic appearance. The entire range of cosmic phenomena can be generated by allowing the intrusion of just one additional item – by starting out with two instead of one. This makes immediate sense of the frequently noticed fact that the detailed descriptions of the cosmos mimic the language of the Way of Truth. For example, in B10 the "encircling heaven" is "bound down by Necessity to hold the limits of the stars," immediately recalling the description of what-is as held motionless by Necessity in the bonds of a limit (B8.30-31). This tends to confirm that the very same sphere is being first correctly described, then, in the cosmology, incorrectly redescribed.

On such an interpretation the Way of Seeming does not vindicate phenomena, but it does address the most glaring problem facing anyone ready to entertain Parmenides' conclusions: how can human experience have got things so catastrophically wrong? Actually, the goddess is telling us, the step from appearance to reality is surprisingly small, a numerical mistake of one.

This admittedly does not even broach the problem of accounting for human error. According to Parmenides, there are no separate thinking subjects. All thinking is what-is thinking itself. How could it find room to misconceive itself? That is a question on which Parmenides left his interpreters to puzzle.[19]

MELISSUS

Melissus can be dated loosely to the mid- or late-fifth century B.C. In outline, his treatise argued that what exists is (i) omnitemporal; (ii) infinite in extent; (iii) one; (iv) homogeneous; (v) changeless, that is, without (a) reordering, (b) pain, (c) grief, or (d) motion; (vi) indivisible; and (vii) bodiless.

This methodical defence of a version of Eleatic monism was written in unadorned Ionian prose, worlds away from Parmenides' high-flown poetic obscurities. Thanks to its relative simplicity, its formulations were to be more widely reflected in ancient formulations of Eleaticism than those of Parmenides himself. The conclusions are by and large Parmenidean, but the arguments are not. There is little sign of Parmenides' most fundamental premise, the rejection of "... is not." Furthermore, whereas Parmenides, as we saw, in the main inferred each predicate of what-is by an independent argument, nearly all Melissus' arguments form a single chain, with each predicate inferred directly from the previous one.

Melissus is not interested in Parmenides' highly refined mode of investigation through the logic of being and negation. He writes, I suggest, as an Ionian physicist addressing a like-minded audience, and expounds the Eleatic One with arguments appropriate to Ionian cosmology. The title of his treatise (probably authentic, despite some scholars' hesitation), *Peri physeôs ê peri tou ontos* (*On nature or on what-is*), in effect labels his account as an Eleatic *physics*. His departures from Parmenides, in permitting himself ordinary temporal language and in postulating a spatially infinite being, are more symptomatic of this project than of intellectual independence.

For the book's first two arguments, we have a probably complete text. However, I believe that scholars have failed to locate correctly the division between argument (i), about temporal infinity, and argument (ii), about spatial infinity.[20]

(i) "Omnitemporal"

(DK 30 B1) It always was what it was, and always will be. For if it came to be, it is necessary that before it came to be there [or "it"] was nothing. Well if there [or "it"] was nothing, nothing could ever come to be out of nothing. (B2, beginning) Since, then, it did not come to be, it both is and always was and always will be.

Where Parmenides had started from a highly paradoxical premise, the rejection of "... is not," Melissus' starting premise, the causal thesis that "Nothing could come to be out of nothing," would hardly cause a stir in his audience. Some such principle or assumption had lain at the root of the ubiquitous early Greek postulation of an everlasting primeval stuff of the universe. The principle, rarely if ever challenged in antiquity, was generally regarded as indubitable. (Comparably to Parmenides, Melissus leaves us to supply the converse principle, "Nothing could perish into nothing" as grounds for future indestructibility.)

Also unsurprising, especially in an east Greek context,[21] is Melissus' expression of this permanence in terms of omnitemporality, where Parmenides had chosen to collapse past and future into the present. This need not be a significant philosophical disagreement. Melissus may simply see himself as presenting Parmenidean thought in the philosophical idiom which his audience understands.

(ii) "Infinite in extent"

(continuing B2) And it has no [spatial] beginning or end, but is infinite. For if it had come to be it would have a [spatial] beginning (for it would have begun the process of coming-to-be at some time) and end (for it would have ended the process of coming-to-be at some time). But since it neither began nor ended [the process], and always was and always will be, it has no [spatial] beginning or end.

Critics since Aristotle have detected here the fallacious inference: "If *p*, *q*: but not-*p*; therefore not-*q*." But this is probably unfair. Where Parmenides' arguments had evidently addressed an audience used to the concept of a finite universe, Melissus assumes the opposite, as we might too – that the universe will be infinite unless it can be shown to be otherwise. This again reflects his audience's background in Ionian physics, where the infinity of the universe, prefigured as early as Anaximander, was by Melissus' day a feature of Anaxagoras' cosmology and on its way to becoming a cardinal doctrine of atomism.

Melissus' question is: what could have set bounds on that-which-is? If nothing, then it is infinite. The one thing that could have made it finite is a process of generation, which, being temporally bounded, could only have produced a spatially finite being. You cannot *create* an infinitely large entity, any more than you can build an infinitely long road, given only that any such process must start at some time (and hence somewhere) and stop at some time (and hence somewhere). Since, therefore, argument (i) has already demonstrated that it never came to be, there is nothing to limit it spatially, and it becomes infinite by default.

Melissus adds, somewhat obscurely, how the spatial infinity of argument (ii) is both inferentially dependent on and parallel to the temporal infinity of argument (i). B2-4 may be continuous, as follows:

> (end of B2) For what is not *all* would not be able to be *always*. (B3) But just as it is always, so too it must also always be infinite in magnitude. (B4) Nothing is either omnitemporal or infinite if it has a beginning and end.[22]

Melissus' next move is from (ii) spatial infinity to (iii) unity: "For if there were two, they would not be able to be infinite, but would have boundaries in relation to each other" (B6). This predicate gives Melissus' entity its name, "the One." And from (iii) unity, he infers (iv) homogeneity (it is "alike everywhere"), on the ground that anything heterogeneous would thereby be a plurality (*MXG* 974a12-14).[23]

The surface meaning of these two successive inferences is largely unambiguous – a far cry from Parmenides. What remains open to debate is the quality of argument. The Peripatetic Eudemus was perhaps unfair to object that the move from (ii) to (iii) works only for things infinite in all directions, since Melissus clearly does have that kind of infinity in mind in (ii). On the other hand, the only kind of unity that the inference can plausibly yield is uniqueness, and mere uniqueness is not incompatible with being a heterogeneous plurality (most of us, for example, believe the universe to have both properties).

After a brief summary of the results so far (B7.1), there follows a generic argument for the next predicate,

(v) "changeless"

> And it could neither lose anything nor become larger nor be rearranged, nor does it suffer pain or grief. For if any of these happened to it, it would no longer be one. For if it changes, it is necessary that what-is is not alike, but that what previously was perishes while what-is-not comes to be. So if it were to become changed by a single hair in ten thousand years, it would all perish in the whole of time.

Formally, given the chain structure of the reasoning, this is meant to be a new inference from (iv) homogeneity, although the inferential connexion is weak at best. Would the supposition of change really prevent its being "alike," and hence "one," in the senses in which these predicates were used in arguments (iv) and (iii) respectively? Much more interesting is the additional ground for changelessness, which derives from predicate (i), "omnitemporal": any change involves some measure of perishing, and if a thing's parts are perishable the whole too will perish, given infinite time. If a thing's parts are severally perishable, it is *possible* for them all to perish together, and (an implicit anticipation of the Principle of Plenitude?) whatever is possible cannot remain unactualized for ever.

There follow four arguments against four specific kinds of change (B7.3-10). The first three, against (a) reordering, (b) pain, and (c) grief, are largely a reapplication of the generic argument that change would negate the established predicates (i) "omnitemporal" and (iv) "homogeneous." But under (b) Melissus adds the consideration that for the One to feel pain would be a diminution of its "power." This remark falls outside the inferential chain but conveys the important clue that the One is being assimilated to a deity.[24] The equation of the primary existent to god is, once again, sufficiently familiar to an audience attuned to the work of Anaximander, Anaximenes, and Heraclitus to be assumed without argument. But it also constitutes a link to Parmenides, whom we found to be conforming to that same tradition when he identified thinking with being.

The most important argument against a specific form of change is that against motion (B7.7-10), which can be divided up as follows:[25]

(v)(d) Motionless

1. Nor is there anything void. For void is nothing. Well, what is nothing could not very well exist.
2. Nor does it move. For it cannot give way at any point, but is full. For if there were void, it would give way into the void; but since there is no void, it has nowhere to give way. (There could not be dense and rare. For what is rare cannot be as full as what is dense, but what is rare already thereby becomes emptier than what is dense. And that is the criterion for distinguishing between what is full and what is not full. Hence if something gives way or absorbs, it is not full, but if it neither gives way nor absorbs, it is full.)
3. [summary] Hence (1) it must be full, if there is no such thing as void; and hence (2) if it is full, it does not move.

This is the first recorded argument that explicitly makes motion dependent on void (even if the absence of void may already be implicit in Parmenides' refutation of motion). And Melissus' rejection of void, as being nothing and therefore nonexistent, is the nearest he comes to the Parmenidean mode of argument through the logic of being and negation. He is not denying an *external* void into which the One might move. This is hardly necessary, given that the One is infinite in all directions. He is denying any *admixture* of void that would make it less than totally dense and thus permit motion by compression or redistribution: that is the point of the parenthetical statement in (2).

There remains the inference from (v)(d) "motionless" to (vi) "indivisible" (B10): division is taken to be a process that involves the motion of the parts being separated. Finally, we come to an inference (B9) that is hard to fit into the continuous chain, being in fact a further derivation from predicate (iii):

(vii) Bodiless

Being one, it must not have (a?) body. If it had bulk, it would have parts and no longer be one.

It is puzzling that the One, having been shown to be totally dense and therefore immobile, should now prove to be incorporeal. In principle it seems likelier that he is denying here that it has *a* body, with organic parts, and is thereby rejecting an anthropomorphic conception of divinity. Admittedly, however, the reference to "bulk" suggests that corporeality as such should be the target.

Just as Parmenides had criticized reliance on the senses (B6), so too Melissus, apparently in a separate section of his treatise, turned his ontological conclusions against the senses (B8):

> That then is the strongest evidence that there is just one thing, but the following are further pieces of evidence.
>
> If there were many things, they must be such as I say the One is. For if there are earth, water, air, fire, iron, gold, living creature and dead, black and white, and the other things people say to be real – if there are these things, and we see and hear correctly, each of them ought to be just as it first seemed to us to be, and not to be changing or becoming different: each of them ought to stay just as it is.
>
> Yet as it is, we claim that we do see, hear and understand correctly. And it appears to us that the hot becomes cold and the cold hot, the hard soft and the soft hard; that the living creature dies and comes to be out of what is not alive; and that all these things undergo alteration and that what they were and what they are now are not at all alike; that iron, although hard, is worn away by contact with the finger, and so too gold, stone and everything else that is thought to be hard; and that earth and stone come to be out of water.
>
> Well, these things are inconsistent. We said that there are many everlasting things which have forms and strength, yet it seems to us that everything undergoes alteration and changes from the state we see it in each time. Hence it is clear that we do not see correctly, and that the appearance that this plurality of things exists is incorrect. For they would not be changing if they were real, but each would *be* such as it appeared. For nothing is more powerful than what is real, whereas if it changes what-is has perished and what-is-not has come to be.
>
> In this way, then, if there were many things, they would have to be such as the One is.

What exists must be changeless (predicate (v)). If sense objects existed, they would have to be changeless. But the senses themselves report them as changing. Therefore sense objects are illusory.

Retrospect

Earlier traditions in cosmology had investigated the composition of the universe by primarily empirical means, seeking to identify a privileged stuff in the cycle of elemental transformation, and to account for the regularities of its behaviour by assimilation to familiar biological, mechanical, or political models of order. Neither Parmenides nor Melissus attempts to step altogether outside the discipline of cosmology. Staying within it, they question its use of empirical criteria, which had come up with too many competing answers to inspire confidence. Both therefore recommend a new start, an appeal to a priori principles to see how far these may narrow down the possible answers to the cosmologists' questions. The outcome is shocking: in virtue of its perfect homogeneity over time and space, the universe can possess none of the differentiating features that cosmologists had hitherto made their *explananda*.

So far, there is no difference between Parmenides and Melissus, apart from the stylistic differences that typically separate prose from verse. They further share – a natural corollary to their a priori approach – an intense interest in inferential method, although here Melissus goes further in imposing a clearer overall architectonic on his argument. Even the kind of a priori premises to which they appeal may overlap to some extent – for example, considerations of how available space may constrain motion. Yet, it is here that their greatest differences can be located too. Parmenides' starting points themselves fall outside the physical tradition: the principles of reference and negation, the conditions of thought, and the logical behaviour of the verb "to be." Melissus' are the kind of a priori principles – the impossibility of generation *ex nihilo*, the infinity of space and time – with which his cosmologically attuned audience would already feel comfortable. Melissus can thus be compared to Zeno. Each in his own way undertook to defend Parmenides' world view to a disbelieving audience by promoting it in that audience's own terms. Zeno had done so by dialectical appeal to their commonplace assumptions about space and time. Melissus approached the same task by a physicist's appeal to the principles of current scientific thinking.

NOTES

1 Most of the interpretations proposed in this chapter can also be found in my two articles, "Melissus" and "Parmenides," in Craig [145].

2 On the opening of Parmenides' poem, see Most in this volume, p. 354.

3 For further treatment of the poem's introduction, see Lesher in this volume, p. 236.

4 Archytas DK 47 A24.

5 Note that whereas Parmenides (see B8.36-38) explicitly rejects time as a self-subsistent entity, he apparently feels no such need in the case of space. In Sedley [409] I argue that even early atomism had no developed conception of self-subsistent space, its void being a space-*occupier.*

6 Depending on the emendation adopted for the impossible *ateleston,* "unbounded": I shall myself favour "balanced."

7 See, among other discussions, Owen [313]; Sorabji [129] ch. 8.

8 I place a comma at the end of line 11, not the usual period.

9 Those who resist the thinking-being identity are forced to translate this as, for example, "For the same thing is there for thinking (i.e., as the object of thought) and for being (i.e., as the subject of 'be')" – a most tortuous piece of syntax. For a detailed defence of the thinking-being identity, see Long [305].

10 I thank Tony Long for this observation.

11 This reading, *oude chronos estin ê estai,* in 36 is well defended by Coxon [270] on the basis of Simplicius' report of the text.

12 To supply what-is as the subject of *onomastai* is the proposal of M. Burnyeat, "Idealism and Greek philosophy," *PR* 91 (1982), 19 n.22, adopted by KRS, 252.

13 *Meizon* and *baioteron* (44–45) mean "larger" and "smaller," not "more" and "less" as suggested in some modern translations of Parmenides.

14 Reading ὁμῶς rather than ὅμως in line 1.

15 For much the same interpretation, see Bodnár [282].

16 For divergent accounts of Parmenides in this volume, see Graham, p. 165, Lesher, p. 240, and McKirahan, p. 157 n. 15.

17 Furley [293].

18 Popper [316].

19 For further discussion of Parmenides' handling of human error and cognition, see Lesher and Laks in this volume, pp. 239 and 255.

20 Argument (i): (B1) ἀεὶ ἦν ὅ τι ἦν καὶ ἀεὶ ἔσται. εἰ γὰρ ἐγένετο, ἀναγκαῖόν ἐστι πρὶν γενέσθαι εἶναι μηδέν· εἰ τοίνυν μηδὲν ἦν, οὐδαμὰ ἂν γένοιτο οὐδὲν ἐκ μηδενός. (B2, beginning) ὅτε τοίνυν οὐκ ἐγένετο, ἔστι τε καὶ ἀεὶ ἦν καὶ ἀεὶ ἔσται. Argument (ii): (remainder of B2) καὶ ἀρχὴν οὐκ ἔχει οὐδὲ τελευτήν, ἀλλ' ἄπειρόν ἐστιν. εἰ μὲν γὰρ ἐγένετο, ἀρχὴν ἂν εἶχεν (ἤρξατο γὰρ ἄν ποτε γινόμενον) καὶ τελευτήν (ἐτελεύτησε γὰρ ἄν ποτε γινόμενον). ὅτε δὲ μήτε ἤρξατο μήτε ἐτελεύτησεν, ἀεί τε ἦν καὶ ἀεὶ ἔσται, οὐκ ἔχει ἀρχὴν οὐδὲ τελευτήν. In fr. 2 there is no need to add ⟨καὶ⟩ before οὐκ ἔχει ἀρχὴν, with Diels-Kranz and others: it is sufficient to take the preceding τε as "and" instead of "both". That argument (ii) addresses spatial infinity (see especially Reale [277]) has not been generally appreciated in the English-language literature on Melissus, but see KRS, 393-95 for an honourable exception.

21 Cf. Heraclitus DK 22B30.

22 (end of B2) οὐ γὰρ ἀεὶ εἶναι ἀνυστόν, ὅτι μὴ πᾶν ἔστι. (B3) ἀλλ' ὥσπερ ἔστιν ἀεί, οὕτω καὶ τὸ μέγεθος ἄπειρον ἀεὶ χρὴ εἶναι. (B4) ἀρχήν τε καὶ τέλος ἔχον οὐδὲν οὔτε ἀίδιον οὔτε ἄπειρόν ἐστιν.

23 The citation is of the paraphrase of Melissus in the pseudo-Aristotelian *De Melisso, Xenophane, Gorgia*.

24 For reports that Melissus identified the One with god, see DK 30 A13.

25 Analysis based on Sedley [409] 178–79.

RICHARD D. MCKIRAHAN JR.

7 Zeno

Much of our little information on Zeno's life comes from the prologue of Plato's *Parmenides*. Most scholars accept Plato's statement that when Socrates was "very young" (though old enough to engage in philosophical debate) Zeno was forty and Parmenides was sixty-five (*Parm.* 127a-b). The setting of the *Parmenides* is the quadrennial Great Athenaia, and the best guesses for its dramatic date are 454 B.C. when Socrates was 15 and 450 B.C. when he was 19.[1] Also, Plato's statement that "Zeno was of a good height and handsome to see; the story goes that he had been Parmenides' young lover" (127b) is perfectly possible, though not otherwise attested. Even if the setting of the *Parmenides* is historically plausible,[2] the notorious unreliability of Plato's reports on earlier philosophers makes it unwise to take much else of what he says on trust. The conversation in the *Parmenides* certainly did not take place, and we may fairly doubt that Socrates met the philosophers from Elea. Further, Plato indicates that Zeno's treatise was unknown in Athens prior to the dramatic date of the *Parmenides* (127c), but he also implies that it was written many years earlier, and he says it had been circulated (apparently soon after its writing) without Zeno's authorization (128d) – claims that although not actually contradictory are hard to reconcile.[3]

Plato declares that the book aimed to defend Parmenides against those who pointed out absurd consequences of Parmenides' view that there is only one thing. It contained arguments that showed that even greater absurdities follow from the hypothesis of these opponents – "if there are many things" – than from the view they attacked (128c-d). But we need to exercise caution about all this. Indeed, all we know about Zeno confirms that the treatise contained a number of arguments. Possibly the book left the goal of the arguments unclear; Socrates infers its purpose after hearing it through (128a-b). If so, then Plato's assertions are an interpretation and one that demands close examination.

In fact, Plato's interpretation is open to question on several grounds. First and most obvious, although according to Plato the aim of Zeno's work was "to contend, against all that is said, that things are not many... each of your arguments proves this" (127e), several of the arguments attack not plurality but motion, and others have other targets. Further, the philosophical link asserted to hold between Parmenides and Zeno, that while Parmenides argued positively for a radical monism, Zeno defended this position by arguing against pluralism (128b-c), has been denied. Still worse, some have held that some of Zeno's arguments actually tell against Parmenides as much as his opponents. Plato's interpretation is fatally flawed if these charges are true, and all that remains of Zeno is a number of arguments of varying merit, each of which is worth scrutinizing on its own, but which taken together do not add up to anything as a whole.[4]

In what follows, I shall resist the current of this interpretation. Granted that Zeno's importance resides mainly in his individual arguments, granted also that Zeno's link with Parmenides requires investigating, there still remains much to be said for Plato's claim that Zeno's purpose was to repay those who ridiculed Eleatic philosophy in their own coin.

ZENO'S FIRST PARADOX

Zeno's book mentioned by Plato contained forty arguments against plurality.[5] It is not always clear what counts as a single Zenonian argument, but on a plausible count about a dozen survive,[6] only half of which straightforwardly attack plurality.

According to Plato, the first argument met this description. It ran as follows: "If things that are are many, they must be both like and unlike, but this is impossible. For unlike things cannot be like, nor can like things be unlike" (*Parm.* 127e). Plato interprets Zeno as arguing that if things were many they would have impossible attributes, therefore, things are not many. He further interprets this argument as supporting Parmenidean monism.

I shall take up these issues in reverse order. First, regarding monism, some hold that Parmenides was not in fact a monist,[7] so that Plato's interpretation of Zeno is desperately wrong. I disagree with this interpretation of Parmenides, but as space does not permit, I cannot argue the point here.[8] It has also been remarked that monism and pluralism are not the only possible views: rejecting one does not entail accepting the other. A third possible view, that nothing exists, was propounded in the fifth century by Gorgias.[9] I find this consideration logically sound but unconvincing. The issue is not whether there are other formal possibilities, but what ideas were current at the time and what were Zeno's targets. From chronological considerations, Gorgias could hardly have proposed his theory before Zeno wrote his book, and there is no reason to suppose that when Zeno was writing nihilism was in the air. Further, if Zeno's opponents were "advocates of plurality" (128d), it is sound strategy to prove their view untenable. Once dislodged from it, they will be more amenable to Parmenides' positive arguments for monism. In fact, Plato makes it clear that Zeno's arguments do not amount to a proof of monism; when Socrates suggests that they do, Zeno replies that they do not, but only attack pluralism (128b-d).

Second, Plato reveals that Zeno's argument is formally incomplete. Zeno said that if (a) things are many, then (b) they are both like and unlike; but (b) is impossible. It is Socrates, not Zeno, who goes on to infer that the impossibility of (b) entails the falsity of (a). This final step is characteristic of the arguments known as *reductio ad absurdum* and *reductio ad impossibile.* To prove *X* false, show that *X* entails *Y*, where *Y* is absurd or impossible; since *Y* is absurd or impossible, it follows that *X* is false. Since all the surviving arguments proceed by showing that something absurd or impossible follows from a hypothesis, but not one contains this characteristic move, it has been claimed that Zeno "does not use *reductio ad absurdum* as a technique for disproof."[10] This claim too though logically correct fails to persuade. Plato makes it abundantly clear that the argument aims to disprove (a). If Zeno does not actually go on to draw the inference that (a) is impossible, the context makes it clear that this is the conclusion to be drawn (what else could be the point of the argument?), and once we see that (b) is impossible, Zeno expects us to reach this conclusion on our own. Rhetorically if not formally, the argument is a *reductio.*

Third, Plato does not say how Zeno got from (a) "if things that are are many" to (b) "they must be both like and unlike." Also, there is no way to know precisely what he means by like and unlike. Furthermore, the reason why (b) is held impossible, namely (c) "unlike things cannot be like, nor can like things be unlike," can be understood in more than one way. This state of the evidence makes it impossible to reconstruct the argument with any confidence. On one account it went as follows. If there are many things, there are at least two. Pick two of them, *A* and *B*. *A* is unlike *B* because *A* differs from *B* in at least one way (*A* is different from *B*, but *B* is not different from *B*). Likewise, *B* is unlike *A*. But *A* is like *A* (since *A* is not different from *A* in any way), and *B* is like *B*. Therefore, *A* and *B* are both like and unlike. If this was Zeno's reasoning, the argument fails because *A* and *B* can be like and unlike in the way indicated; the alleged impossibility would arise only if the same things are both like and unlike the same things in the same respect, at the same time, and so on.[11] Zeno may have reached this conclusion validly, but if so, we have no clue how he did.

Fourth, the argument is an antinomy. In this particular form of *reductio ad impossibile*, the impossibility inferred from the premise is a logical contradiction of the form "*p* and not-*p*." This kind of argument is typically Zenonian. We hear of other arguments that show that the same things are one and many and are moving and at rest (Plato, *Phaedrus* 261d). One argument is preserved that argues that if there are many things, the same things are limited (*peperasmenon*) and unlimited (*apeiron*) (DK 29 B3). Another argument concludes that each of the many is both small and large (part of this argument is found in B1-2). The arguments on motion can be construed as antinomies too.

ANOTHER PARADOX OF PLURALITY

"Zeno stated that if anyone could make clear to him what the one is, he would be able to speak of existing things" (Eudemus, *Phys.* fr. 7, quoted in Simplicius, *In phys.* 97.12-13). This was Zeno's challenge to pluralists: give me a coherent account of what it is to be one of your many things and I will grant you your pluralism. He then proceeded to demonstrate the impossibilities that result from various conceptions of pluralism.[12]

One of these arguments, apparently directed against the view that there are three-dimensional bodies, involves the antinomy that if things are many, they are both small and large, specifically (a) so small as to have no size and (b) so large as to be unlimited (*apeiron*). Zeno holds not only that (a) and (b) are mutually inconsistent but also that each of them presents serious difficulties in its own right.

The reasoning for (a) is incompletely preserved. We are told only that Zeno argued that each of the many is "the same as itself and one" and from that he concluded that each has no size. He then argued that "anything with no size, thickness or bulk does not exist," as follows.

> For if it should be added to something that exists, it would not make it any bigger. For if it were of no size and was added, it [the thing it is added to] cannot increase in size. And so it follows immediately that what is added is nothing. But if when subtracted, the other thing is no smaller, nor is it increased when it is added, clearly the thing being added or subtracted is nothing. (B2)

He then argued for (b).

> But if it exists [or, if they (the many things) exist], each thing must have some size and thickness, and part of it must be apart from the rest. And the same reasoning holds concerning the part that is in front. For that too will have size and part of it will be in front. Now it is the same thing to say this once and to keep saying it forever. For no such part of it will be last, nor will there be one part ⟨of any such part⟩ not related to another. Therefore, if there are many things, they must be both small and large; so small as not to have size, but so large as to be unlimited. (B1)

If there are many things, then according to B2 each of them has size. Consider any one of them. We can distinguish one part of it from the rest. This part has size (otherwise, by B2, it would not exist), so we can distinguish a part of *it* from the rest. This part too has size, and so on forever: we never reach a *last* subpart.

Zeno concludes: "if there are many things, they must be ... so large as to be unlimited." It is commonly held that the argument shows that anything with positive (finite) size has an infinite number of parts, each with positive size, and that Zeno erred in thinking that the sum of an infinite number of positive magnitudes must be infinite.[13] But the argument does not point in this direction, and the conclusion can be taken otherwise. The problem is not how to reconstitute the original thing once it has been divided into an infinite number of parts, but how to complete the division. If the division stops somewhere, so that at some point we reach the minimal building-blocks out of which the original thing is composed, the regress is blocked; *these* are the ones out of which our many is made. But Zeno shows that there is no good reason for stopping the division. Anything extended in space can be divided into parts that are themselves extended in space, so we can in principle never finish the division. He concludes that each of the many things is so large that it has an unlimited number of parts – without committing himself to a view on the question of whether anything with an unlimited number of parts can have a limited size.

It is important to note that the argument does not require *matter* to be infinitely divisible. Clearly, if there are smallest units of matter (as in ancient atomism, for example), *physical* division comes to an end at a certain point. But the argument applies even to individual atoms. We can mentally distinguish the right half from the left half of an atom, and likewise distinguish the right half of the right half from the left half of the right half, and this process of mental or "theoretical" division never reaches an end.[14] All the argument requires is the assumption that spatial extension is continuous.[15]

Apeiron AND INFINITY

Zeno's deployment of *apeiron* and related notions in the argument just discussed and more famously in some of the paradoxes of motion, has given rise to most of the excitement that the paradoxes have generated, especially in the twentieth century.[16] In certain contexts *apeiron* can be rendered as "infinite," and many of Zeno's arguments involve infinite regresses. Moreover, certain arguments, especially the Dichotomy, the Achilles, and the Flying Arrow, raise issues that could not be properly dealt with before the theory of the mathematical infinite was developed in the nineteenth century. Much of the most important work on the paradoxes in this century has been a matter of interpreting them in terms of this theory and its possible physical applications. I shall return to these matters, but now I want to point out that in an important sense this work is anachronistic and wrong-headed.

It is one thing to ask what Zeno or any other philosopher meant by what he said and another to ask what a philosopher's words mean to us. Similarly, what counted for Zeno as a problem or a solution may not be the same as what counts as such for us. The philosopher who takes Zeno's paradoxes seriously and addresses the problems they raise is doing something different from the historian of philosophy who aims to understand what Zeno meant by the paradoxes, and what would be satisfactory solutions for him. Since at least Aristotle's time, philosophers have regarded the paradoxes as puzzles demanding solution, and their solutions have typically involved theories, concepts, and distinctions unknown to Zeno. It is remarkable that Zeno could formulate puzzles that go to the heart of our conceptions of space, time, and motion; this is a good reason to examine them in the light of our own theories. But we also need to keep in mind the distinctions drawn above, and the frequent failure to do so by historians of philosophy as well as philosophers has made Zeno a much misunderstood man.

Regarding the key word *apeiron*, it is safe to say that it did not mean "infinite" in Zeno's time. It is a compound of *a-*, meaning "not," and either the noun *peras* (limit, boundary), so that it means "unlimited," "boundless," "indefinite," or the root *per-* (through, beyond, forward), so that it means "unable to be got through," or "what cannot be traversed from end to end." Zeno contrasts *apeiron* with *peperasmenon*, "limited" (B3): In Aristotle these words have the meanings "infinite" and "finite." Aristotle worked out a theory of the infinite in some technical detail and mobilized this theory against Zeno, but the fifth century was innocent of such technical meanings. In that age, something that was *apeiron* was "inexhaustible," "vast," "endless," such as the "boundlessly high air" (Euripides, fr. 941), and "a plain stretching away without limit as far as the eye can see" (Herodotus, I.204). In particular, *by definition* anything that is *apeiron* has *no* limits; in this way what is *apeiron* for Zeno is crucially different from what we regard as infinite, in particular certain infinite sequences. We are accustomed to think that the infinite sequence 1/2, 1/4, 1/8,... has no last term but does have a limit 0, and that the infinite sequence of partial sums 1/2, 3/4, 7/8... likewise has no last term but has a finite limit, 1; for Zeno the corresponding thoughts framed in terms of *apeiron* would have been self-contradictory. He claims it is impossible to perform an *apeiron* sequence of tasks, one that by definition has no limit. To say that mathematicians prove that this is possible by defining the sum of the original infinite sequence as the limit of the partial sums deserves a contemptuous retort: "Stipulating a definition doesn't make anything possible, especially when the definition is a contradiction! What is *apeiron* has no limit, and simply declaring that some *apeiron* things have limits doesn't make it so."

This is not the last word on the subject – clearly – but it shows that since Zeno's conception of *apeiron* is not identical with our notion of the infinite, to state the paradox in terms of the infinite and solve it in those terms is to state and solve a different paradox. This is not to claim that there is no place at all for this approach, only to call attention to what we are doing when we tackle old paradoxes with modern tools. In fact, the modern notion of the infinite is superior to Zeno's conception of the *apeiron*. For example, unlike Zeno it distinguishes among different sizes of infinities, it enables us to do mathematical operations involving infinite quantities, to compare infinite quantities in a precise way, and to specify different respects in which a single thing can be infinite. Where he bluntly asserted that it is impossible to perform an *apeiron* sequence of tasks, we now know that some infinite sequences of tasks can be completed, though some cannot, and we can explain why. How these observations apply to the paradoxes of motion will be apparent in what follows.

THE ARGUMENTS AGAINST MOTION

"Four of Zeno's arguments concerning motion cause difficulties for those who try to solve them," says Aristotle (*Phys.* VI.9 239b9), reporting the quartet of paradoxes that have caused difficulties right up to the present time and show every sign of continuing to do so. Whether these arguments were among the forty against plurality is disputed. If they were not, then not all of Zeno's paradoxes appeared in the book Plato mentions; if they were, then Plato's statement that all the paradoxes in the book were directed against pluralism is rendered dubious – though not as dubious as some think, since motion involves a plurality of places and times. Moreover we have seen that one of the paradoxes that is certainly directed against pluralism relies on assumptions about space.

Typically, Aristotle sees the paradoxes as puzzles that need to be solved; he is not out to understand them in Zeno's terms. He summarizes them in bare-bones fashion and presents his own solutions, most of which are based on concepts that he himself developed and that were not available to Zeno. I shall discuss three of the four paradoxes,[17] beginning with the Dichotomy and the Achilles, which Aristotle declares amount to the same thing.

The Dichotomy

> There is no motion, because what is moving must reach the midpoint before the end (*Phys.* VI.9 239b11). It is always necessary to cross half the distance, but these are infinite (*apeiron*), and it is impossible to get through things that are infinite (*Phys.* VIII.8 263a5).

The Achilles

> The slowest as it runs will never be caught by the fastest. For the pursuer must first reach the point from which the pursued departed, so that the slower must always be some distance in front (*Phys.* VI.9 239b14).

As Aristotle sees it, the Achilles "is the same argument as the Dichotomy, but it differs in not dividing the given magnitude in half" (*Phys.* VI.9 239b18-20). Aristotle solves them both by means of his distinction between infinite in extent or quantity and infinite by division:

> It is impossible to come into contact with things infinite in quantity in a finite time, but it is possible to do so with things that are infinite in division. For time too is infinite in this way [i.e., infinite in division]. And so it follows that it crosses the infinite in an infinite, not a finite time, and comes into contact with infinite things in infinite, not finite times. (*Phys.* VI.2 233a26-31).

Although the paradoxes can both be treated this way, even in Aristotle's summaries they are importantly different. The Dichotomy explicitly turns on an alleged property of the infinite, while the Achilles does not mention the infinite, but turns on the terms "always" and "never." As we have them, they are subject to different analyses; I shall take them up separately.

THE DICHOTOMY

Following is an expanded reading of the Dichotomy:

> There is no motion. Motion involves going from one place to another. Consider, for example, motion across a stadium. To get from the starting line (A) to the finish line (B), we must first reach A_1, the midpoint of the interval AB. But in order to get from A_1 to B, we must first reach A_2, the midpoint of A_1B, and so on. Each time we reach the midpoint of an interval we still have another interval to cross, which has a midpoint of its own. There is an infinite number of intervals to cross. But it is impossible to cross an infinite number of intervals. Therefore we cannot reach the finish line.

On an alternative reading, Zeno argues that in order to reach A_1, we must first reach the midpoint of the interval AA_1, and so on. The difference between these interpretations can be put with rhetorical effectiveness as follows: on the first reading you cannot *complete* a motion, on the second reading you cannot *begin* one. Either way the point is the same: motion is proved impossible because any motion involves an endless sequence of tasks.

Zeno attacks the view that there is motion. We can imagine that the Dichotomy constituted part of an antinomy: (a) If there is motion, then the motion from A to B takes a limited number of steps. (This is our ordinary view. For example, we can cover 100 m. in 100 steps of 1 m. each.) (b) If there is motion, then the motion from A to B takes an unlimited number of steps. (This follows from the description of motion presented in the Dichotomy.)[18]

Whether or not this imaginary reconstruction is correct, the Dichotomy argues that a belief contrary to one of Parmenides' views, here the Parmenidean view that what is does not move, involves a logical impossibility. Anyone who believes that there is motion is committed to the belief that it is possible to get to the end of an endless series of submotions. (In other words, it is possible to complete an uncompletable series, to reach the limit of an unlimited series or the boundary of an unbounded series). But this is flatly impossible. If the series is endless (or uncompletable or unlimited or boundless), it has no end (limit, and so on), so there can be no way to reach its end.

To resist Zeno's conclusion, we must show that motion does not involve the impossible. One response is that of Antisthenes the Cynic who, "since he could not contradict Zeno's arguments against motion, stood up and took a step, thinking that a demonstration through what was obvious was stronger than any opposition in arguments" (Elias, *In cat.* 109.20-22) – a comically inadequate refutation, since Zeno did not deny that our senses tell us that there is motion. (The Eleatics consequently rejected the senses as unreliable.) Simply providing one more instance of apparent motion whose reality Zeno would deny means that Antisthenes either completely misunderstood Zeno's point or felt the need to prove (to himself if not to Zeno) that he could still move.

Another way to avoid Zeno's conclusion is to show that he misdescribes the situation. The paradox does not arise if it is not true that we must reach the midpoint before reaching the end, and that each time we reach a midpoint what remains is an interval with a midpoint that must be reached before the remaining interval is crossed. But his description is unobjectionable: In order to go the whole distance we must go half the distance, three-quarters of the distance, and so on. As long as space is continuous, as we (along with Zeno's opponents, we may suppose) intuitively think and as modern physics does not contradict, there is no end to this sequence.

A third way of avoidance is to show that although Zeno does not actually misdescribe the situation, his description is not helpful; a more helpful description would be that in order to reach the finish line we must take some definite number of steps – a task we can complete without difficulty. The idea behind this objection is that motion is possible if there is some description that does not involve impossibility. But this approach stacks the deck unfairly against Zeno. He need not claim that every correct description of motion leads to contradiction, only that at least one correct description does.

Further, if we point out that motion can be correctly described without contradiction, we actually help Zeno's cause. He can now claim that the existence of motion entails the antinomy mentioned above, that it is both possible (as we are pointing out) and impossible (as the Dichotomy proves) to cross any given distance – a contradiction that refutes the premise that there is motion.

In any case, Zeno can accept that alternative description. If it takes 100 steps to reach the finish line we must first take 50, then 25, then 12 1/2, and so on. The opponent will object: fractional steps are not allowed in his description. But Zeno can agree that a fractional step is not a step (12 1/2 steps is not twelve full steps plus one shorter step, thirteen steps in all), but still maintain that to make one step is to move your foot from *A* to *B*, and in doing this your foot moves first to the midpoint between *A* and *B* and so on, so the regress still rears its ugly head. Zeno's challenge to pluralists to provide a coherent account of what it is to be one of their many things applies here too. It is not enough to say that the motion can be described as 100 steps, where the step is the unit of motion. Zeno can fairly press his point against this unit, and when he does so, the opposition collapses.

Another move is to accept that there is an unlimited number of intervals to cross in getting from *A* to *B*, but to object that Zeno errs in assuming that it takes an unlimited amount of time to cross them all. Here we may substitute "infinite" for "unlimited" without affecting the argument. Clearly, if it takes the same length of time to cross each of an infinite number of intervals, the total time will be infinite. This is how Aristotle interpreted the paradox – and he solved it by distinguishing being infinite in division from being infinite in extent. The Dichotomy relies on the infinite divisibility of distance and motion, and does not imply that the total distance is infinite in extent. There is no reason to suppose that the time taken is infinite in extent either; like distance and motion, time is infinite in division. If it takes 1/2 minute to go 1/2 the distance, it will take 1/4 minute to go 1/4 the distance, and so on. So just as the total distance moved is finite, the total time elapsed is also finite. However, the Dichotomy says nothing about taking an infinite extent of *time* to cover the distance. It turns simply on the alleged impossibility of getting through an infinite number of things, not of getting through them in a finite time. As a result, Aristotle's objection (as well as his solution) misfires since it attributes to Zeno an error that there is no reason to suppose he made.

With these objections out of the way, let us examine Zeno's reasoning. As given by Aristotle, the argument has three premises.

1. It is always necessary to cross half the distance.
2. These [namely, the half-distances] are infinite.
3. It is impossible to get through things infinite in number. Therefore,
4. It is impossible to cross the whole distance.

The expanded reading at the beginning of this section restates the premises so that the conclusion (4) follows validly. As earlier, I take it that Zeno's opponents will agree to premises (1) and (2). What of premise (3)?

At this point it will be useful to bring in the notion of the mathematical infinite. For Zeno's description of the situation, so far from involving any logical impossibility, reveals some features of the infinite – features that may strike us as odd and counter-intuitive, and that are false for finite collections but that are inevitable consequences of describing the finite interval *AB* as being composed of an infinite number of subintervals.

There is an infinite number of natural numbers, 1, 2, 3,.... In the Dichotomy the sequence of intervals needing to be crossed can be put into one-to-one correspondence with the sequence of natural numbers. The first interval, AA_1 (the halfway distance from *A* to *B*), corresponds to the number 1, the second interval, A_1 A_2 (the halfway distance from A_1 to *B*), to 2, and so on. There is one natural number for each interval and one interval for each natural number. Now, however far we count the natural numbers, there are still more, and likewise, however many intervals we cross, there are still more. There is no highest number and no last interval. If saying "one" or "two" and so on is an act of counting, then there is no last act of counting that exhausts the natural numbers. Likewise, there is no act of crossing an interval that is the last such act in crossing *AB*. We cannot get through either of these sequences by going through its members one by one.

Further, in certain cases the sum of an infinite sequence of numbers is finite. In particular, consider the sequence mirrored in the Dichotomy, 1/2, 1/4, 1/8..., and call this sequence *T*. It is an infinite sequence, in that it has an infinite number of members. These members correspond to the lengths of the intervals that need to be crossed in crossing the stadium. Call the sum of the first n members of *T* the nth partial sum of *T* and designate the nth partial sum of *T* as S_n. Then $S_1 = 1/2$, $S_2 = 3/4$, and so on. Let *S* stand for the sequence S_1, S_2, S_3,.... The members of *S* correspond to the total distance travelled after each move: 1/2 the stadium after the first move, 3/4 after the second, and so on. There is no last member of *T* or (therefore) of *S*. Since the members of *T* are all greater than zero, as n increases S_n keeps increasing. But since each member of T is only half the size of the previous one, the amount by which S_n increases each time is only half the size of the amount it increased the previous time. In fact, all the partial sums are less then 1. This is precisely like the situation Zeno describes. However many intervals we may cross, we have not yet reached the finish line (i.e., for all n, $S_n < 1$). Also, as n increases, S_n gets as close to 1 as we like (in the precise sense that for any given x no matter how small, there is a y such that $1 - x < S_y$). In these circumstances, mathematicians define the limit of S_n as n approaches infinity as 1. This means precisely that as n gets larger and larger (or as n approaches infinity) S_n gets as close as we like to 1. It does not mean that n ever reaches infinity or that S_n ever reaches 1, and so, it does not require us to speak of completing an infinite number of tasks.

Now this description applies straightforwardly to the motion across the stadium: no matter how many intervals we have crossed, we have not reached the finish line. But since the partial sums correspond to the total distance covered after crossing each successive interval, the limit of the partial sums corresponds to the total distance to be covered, the entire length of the stadium. The more intervals we cross, the closer we are to the finish line. We can get as close to the finish line as we like in the sense that for any given distance from the finish line, no matter how small, there is a definite number of intervals such that once we have crossed them, we are less than the given distance from the finish line, even though there is no interval such that when we cross that interval we reach the finish line.

We can now return to premise (3). Zeno's claim that it is impossible to get through things infinite in number is correct, in that we cannot get through them if we take them one by one. There is no last interval in the infinite sequence of intervals, so there is no last one to take. In other words, there is no interval in the infinite sequence such that by crossing it we finish crossing the stadium. But this does not entail that we cannot cross the stadium at all. The illusion that it does, comes from our tendency to think in finite terms. If it takes 100 steps to cross the stadium, then crossing the stadium requires us to complete all 100 steps; we finish crossing the stadium by taking the last step. So we expect that if crossing the stadium involves crossing an infinite sequence of intervals, we finish crossing the stadium by crossing the last interval. Since there is no last interval, it seems to follow that we cannot manage to cross the stadium. Likewise, we complete a journey of 100 steps by taking the hundredth step, so we expect that we must complete a journey across an infinite sequence of intervals by crossing the infinitieth interval. But since we cannot do an infinite number of tasks one after another, it seems to follow that we cannot complete the journey.

But these results do not follow. In the case at hand we cross the stadium by taking 100 steps. Since the stadium can be described as an infinite sequence of intervals, crossing the stadium involves crossing all of them. Consequently, when we have crossed the stadium by taking 100 steps, we have crossed the infinite sequence of intervals – all of them. This is simply a consequence of Zeno's description of the motion. But it does not imply that we have crossed the (nonexistent) last interval.

One way of stating this point is that to get through either a finite or an infinite sequence of moves, we must get through them all. (When we reach the finish line, we have taken all 100 steps and have crossed the entire infinite sequence of intervals.) But whereas, getting through a finite sequence involves making a last move (the hundredth step), getting through an infinite sequence does not. This means that there is no way to get through an infinite sequence of moves taking them one by one. However, if there is another way to take them, it may be possible to get through them all. This is to say that premise (3) holds for cases where we take the "infinite things" one by one but not necessarily for other ways of taking them. In the present case, we get through the infinite sequence of intervals as the result of taking 100 ordinary steps, so premise (3) does not apply.

The Dichotomy fails. It attempts to show that our ordinary beliefs about motion lead to a contradiction: we believe we can cross the stadium, but premises (1), (2), and (3) entail that we cannot. Our ordinary beliefs commit us to accepting (1) and (2). But the plausibility of (3) depends on a particular way of tackling infinite sequences of tasks. If there are other ways, and in particular if there is another way entailed by crossing the stadium in a finite number of (finite-sized) steps, we do not need to concede Zeno's point. In fact, there is such a way. We can accept his redescription of the motion (premises (1) and (2)) and show that so far from disproving the existence of motion, it is entirely compatible with it. (And this welcome result obtains.) In crossing the stadium in 100 steps, we finish crossing Zeno's first interval after 50 steps. After 25 more we finish crossing Zeno's second interval. By the time we have taken 13 more, we have finished crossing the third interval. (We have gone 88 m. and the third interval ends at 87.5 m.) Likewise, we have finished crossing the fourth, fifth, and sixth intervals by the time we have taken a total of 94, 97, and 99 steps, respectively. By the time we have taken 100 steps, we have finished crossing all the remaining intervals – an infinite number. It *is* possible to get through things that are infinite in this way, which is precisely what we need to refute the Dichotomy. And unlike the earlier attempt at a solution, which stacked the deck unfairly against Zeno, the present solution does not simply put up an alternative description of motion that does not involve impossibility. Instead, it shows that Zeno's redescription of motion not only does not entail any impossibility, but actually yields consequences consistent with the existence of motion – consequences that would cause serious difficulties if they did *not* follow from Zeno's first two premises.

THE ACHILLES

An expanded reading of the Achilles follows.

> Achilles will never catch the tortoise even though he runs faster than the tortoise. By the time he reaches the tortoise's starting point (A) the tortoise will have moved some distance, however small, to a new point (A_1). By the time Achilles reaches A_1 the tortoise will have moved on to a further point (A_2), and so on. Each time Achilles reaches a point where the tortoise has been, the tortoise is no longer there; the tortoise is always ahead, so Achilles never catches up.

As I remarked earlier, this paradox turns on "never" and "always," not on properties of infinite sequences, even though in Zeno's description the race consists of an infinite sequence of stages or subtasks. The paradox is stated from Achilles' point of view as he runs the race. Achilles will never get through all the subtasks needed to complete the original task in the sense that however many subtasks he may have completed at any moment, there are always still more left to do. In these circumstances, it does no good to point out that he is getting as close as he likes (in the sense defined on p. 147) to the tortoise, or that he will catch the tortoise after running a distance equal to $XY/(Y - Z)$ and after running for a time equal to $X/(Y - Z)$, where X is the original head start, Y is Achilles' speed, and Z is the tortoise's speed. The problem is not that there is no time at which he will catch the tortoise, or that there is no point at which he catches it, but that reaching that point (and reaching that time, for that matter) requires doing something impossible.

On a natural way of construing always and never, "the tortoise is always ahead" means "at every time the tortoise is ahead," and "Achilles never catches the tortoise" means "there is no time at which Achilles catches the tortoise." However, the paradox does not establish *these* claims, but requires us to take the two sentences differently, "the tortoise is always ahead" as claiming "at every time during the race (i.e., while Achilles is catching up) the tortoise is ahead," and "Achilles never catches the tortoise" as claiming "there is no time during the race when Achilles catches the tortoise." Clearly, "the tortoise is always ahead while Achilles is catching up" does not entail that the tortoise is always ahead, and yet the harmless former claim is all the paradox proves, whereas it purports to prove the latter, and it is the latter, not the former, that contradicts our ordinary views about motion. It would be dismaying to be told that Achilles will never catch up with the tortoise at all, but quite welcome, indeed unsurprising and virtually tautologous to be told that he does not catch up at any time before the race is over, that is, before he catches up.

The Achilles fails because it trades on ambiguity. Moreover, it sets up an infinite sequence of tasks that is subject to the same analysis as the sequence of intervals in the Dichotomy. The sequence has no final element and cannot be completed by taking the tasks one by one (as the paradox depicts Achilles trying to do). But just as in the previous discussion, the hundredth (constant-length) step we took in crossing the stadium put us in the position of having crossed the entire infinite sequence of intervals that the Dichotomy shows we must cross, so, when Achilles has taken his final (constant-length) pace, he will have completed the entire infinite sequence of tasks that the paradox shows he must complete. Again, a welcome situation that vindicates rather than undermines our ordinary beliefs about motion.

THE FLYING ARROW

If everything is always at rest when it occupies a space equal to itself, and what is moving is always "at a now," the moving arrow is motionless (Aristotle, *Phys.* VI.9 239b5-7).

This argument can be analyzed as follows:

1. If something occupies a space equal to itself at time *t*, it is at rest at *t*.
2. At each instant ("now") of its flight, an arrow occupies a space equal to itself.
3. At each instant ("now") of its flight, the arrow is at rest. (from (1) and (2))
4. What is moving is always "at a now," that is, the entire duration of its motion consists of instants.
5. During the whole of its flight the arrow is at rest. (from (3) and (4))

Some of these statements need elucidation. The purpose of (1) is to provide a sufficient condition for a thing's being at rest, but the corresponding view of motion is difficult to make out. (1) implies that if something is not at rest, that is, if it is in motion, it does not occupy a space equal to itself; presumably it occupies a space larger than itself.[19] If we construe time *t* as an instant, then Zeno is claiming that things in motion *stretch*, so that the purpose of (1) will be to rule out the possibility that things move like a rubber band that originally extends from *A* to *B*, then stretches to extend from *A* to *D*, and then returns to its original size, coming to extend from *C* to *D*. (Thus the distance between *A* and *B* equals the distance between *C* and *D* and is less than the distance between *A* and *D*.) If at instant *t* the rubber band extends from *A* to *D*, it is in motion at *t* in the sense that it is in the process of ceasing to occupy the interval *AB* and coming to occupy the interval *CD*. On this interpretation (3) follows validly from (1) and (2), but it is not clear why Zeno should think that motion necessarily involves stretching. Another possibility is that the time involved, *t*, is an interval, and Zeno holds that if *X*, which remains the same size, changes over interval *t* from occupying interval *AB* to occupying interval *CD*, then over the interval *t* taken as a whole, *X* occupies the whole interval *AD*, which is greater than a space equal to *X* (i.e., *AB*). This is not to say that at any instant in *t*, *X* occupies the whole interval *AD*, or indeed any space that is not equal to itself. On this interpretation (which is admittedly difficult to get out of the text), we have a more plausible account of what happens during motion, and the corresponding claim about rest, that if *X* occupies *AB* throughout *t*, *X* is at rest during *t*, is evidently true. However, the inference via (2) to (3) now becomes invalid, since (2) and (3) are concerned with motion at an instant, not over an interval.

I have supplied (2) and (3); they are not in Aristotle's text, but are the most plausible way to make the argument go through.[20] For in order to have a chance of inferring (5) from (4), we need an additional premise framed in terms of instants (not intervals). In (4) the phrase rendered as "at a now" is usually translated as "in the now"; it means "at an instant."

This paradox raises deep problems about the nature of motion. I shall discuss two. First, a point in connection with premise (1). Zeno assumes that something can be at rest at an instant, a concept which Aristotle showed to be problematic. Aristotle argued that motion cannot take place at an instant; it occurs over an interval of time. Further, since rest is the absence of motion, rest takes place over intervals too; it is no more possible to be at rest at an instant than it is to move at an instant (*Phys.* VI.3 234a24-b9). But (as was finally established in the nineteenth century when the foundations of the calculus were put on a sound basis) Aristotle is wrong. We *do* talk of both motion and rest at an instant ("At precisely 3 minutes and 12 seconds after 8 p.m. I was driving at 65 miles per hour, officer. Also, I was caught in a traffic jam from about 8:10 until about 8:20, so at precisely 15 minutes and π seconds after 8 the car was at rest."), and such talk is not nonsense. Even if the primary sense of motion (and rest) involves an interval of time for the motion to take place, there is a perfectly good secondary or derivative sense in which we may speak of something being *in motion* or *at rest* at an instant – not claiming that anything *moves any distance* in an instant, but that something may have a velocity at an instant, since anything whose velocity is zero is at rest, and anything whose velocity is different from zero is in motion. Velocity over an interval of time is defined as the ratio of the distance covered in that time interval to the length of the interval:

$$v(t_1 t_2) = \frac{d(t_2) - d(t_1)}{t_2 - t_1}$$

Correspondingly, velocity at instant t is equal to the limit (similarly to the sense defined above, p. 147) of the ratio of the distance covered in time intervals containing t to the length of those intervals, as the length of the intervals approaches zero. If t_1 is earlier than t_2, and the interval t_1 t_2 contains t, the velocity at t is the limit as $t_2 - t_1$ approaches zero of the ratio between the distance covered between t_1 and t_2 and the length of the interval between t_1 and t_2 : 21

$$v(t) = \lim_{t_2 - t_1 -> 0} \frac{d(t_2) - d(t_1)}{t_2 - t_1}$$

Second, a point in connection with premise (4). Even if Zeno grants the above point, there remains another problem. At different instants the flying arrow is at different points of its trajectory, but how does it move from one point to another? Aristotle says that Zeno's conclusion "follows from assuming that time is composed of 'nows.' If this is not conceded, the deduction will not go through"(*Phys.* VI.9 239b30-33). The problem as Aristotle sees it is this. If time is atomic, then there are adjacent instants. If something is in motion, it occupies different places at different instants. If t_1 and t_2 are successive instants, something in motion over the interval $t_1 t_2$ occupies different places, $d(t_1)$ and $d(t_2)$, at those instants. But when does it move from $d(t_1)$ to $d(t_2)$? There is no answer, since there is no time, no instant, between t_1 and t_2 for the motion to take place.

Aristotle solves the paradox by denying that time is made up of "nows." Since time is continuous, there are no adjacent instants. For any two instants t_1 and t_2, there is another instant, t_3, between them. Since motion is continuous too, there is a one-to-one correspondence between the instants during the arrow's flight and the positions it occupies during its flight. The arrow moves from $d(t_1)$ to $d(t_2)$ during the interval between t_1 and t_2; for any position $d(t_3)$ on the arrow's path between $d(t_1)$ and $d(t_2)$ there is a time t_3 between t_1 and t_2 at which the arrow is at $d(t_3)$, and for any time t_3 between t_1 and t_2, there is a position d(t_3) on the arrow's path between d(t_1) and d(t_2) which the arrow occupies at t_3. So motion does not involve instantaneous jumps from place to place or from time to time.

This answer is helpful but only to a point. If space, time, and motion are continuous, they are not composed of minimal units of some definite size, as B1 (p. 138) demonstrates. They are not composed of units of zero size, either, according to B2 (p. 138). According to Aristotle, they are composed of intervals, not points; as we have seen, for Aristotle motion involves moving some interval of distance in some interval of time. But the solution of the previous problem, that in a sense there can be motion at an instant, implies that in a sense time, space, and motion *are* composed of (a continuum of) points. Not only can we speak coherently of velocity at instant t, we can also speak coherently of motion over the time interval from t_1 to t_2 as the sum of motions at all the instants from t_1 to t_2. If we know what the velocity is at each point, we can determine the motion over the entire interval by taking the definite integral of the velocity over the interval from t_1 to t_2.

But now something like the original problem recurs. Since motion involves being at different places at different times, there still remains the problem of how the arrow gets from one place to another, or, for that matter, from one time to another. It is not a matter of jumping from one place or time to the next, for in a continuous stretch no point is "next" to another. But it is still a matter of getting from d(t_1) to d(t_2) through all the intervening positions and from t_1 to t_2 through all the intervening times.

The answer is that it does the former by *being* in all the intervening positions and it does the latter by *being* at all the intervening times. For the arrow to move continuously from d(t_1) to d(t_2) over the time interval from t_1 to t_2 is a matter of its occupying different positions from d(t_1) to d(t_2) at all the different times during t_1–t_2 continuously, without any periods of rest and without changing the direction of motion. Likewise, moving throughout the time interval from t_1 to t_2 is a matter of moving during all the different times during the interval from t_1 to t_2. Since motion takes place, strictly speaking, over intervals of space and time and only derivatively at points and instants, it follows that if the arrow moves continuously over the spatial interval from d(t_1) to d(t_2), it gets through all the intervening positions. Likewise, if it moves continuously during the time interval from t_1 to t_2, it gets through all the intervening times.

At the level of the individual points and instants, the answer is that for the arrow to be moving (to have a velocity unequal to zero) when it is occupying a given position d(t) is for it to be moving over some interval of space which includes d(t). Also, for the arrow to be moving at instant t is for it to be moving in some interval of time which includes t. Again, the problem of how the arrow gets from one position to another or from one time to another during its flight is solved by pointing out that that is precisely what it means for the arrow to be flying.

THE PARADOXES: CONCLUSION

I have selected some of these paradoxes for their historical and philosophical importance, and others because they seem to display characteristic features of Zeno's way of thinking. Other paradoxes survive, each with its own peculiar twists. But by now enough material is at hand to bring this sketch to a conclusion.

The arguments considered here attack plurality and motion. Another argument attacks the reliability of the sense of hearing and another attacks the belief that things have locations. Since ordinary people (as opposed, perhaps, to some philosophers) believe in plurality and motion, rely (at least to some extent) on the senses, and think that some things have locations, there is some reason to think that Zeno directed his paradoxes against ordinary views about the world, and I have presented the paradoxes along these lines. Plato's statement that Zeno's book "is a defence of Parmenides' argument against those who make fun of it, saying that if there is One, the argument has many ridiculous consequences that contradict it" (*Parm.* 128c-d) does not conflict with this view. Ordinary unphilosophical people who heard Parmenides' poem would very likely ridicule it for these very reasons.

At one time it was commonly believed that Zeno composed his paradoxes with particular philosophers and mathematicians in mind, primarily the Pythagoreans. Others have argued that Zeno was out to disprove all possible theories of space, time, and motion; he set out not just to refute the ideas of ordinary people or those of particular philosophers, but to construct stumbling-blocks for all possible theories of the nature of space, time, and motion. For example, the Dichotomy and the Achilles attack theories that space and time are infinitely divisible and the Flying Arrow attacks theories that space and time are finitely divisible.[22] However, the evidence for these views is slim to nonexistent and they have gone out of fashion. What remains is the fact that Zeno attacks common sense, which is not the exclusive prerogative of philosophers.

Plato's testimony about Zeno is left standing as a viable interpretation. We have found no good reason to doubt that Zeno's purpose was to support Parmenides in the ways discussed above (pp. 134–36, 143 and n.12). And even though Plato says that all of Zeno's arguments attack plurality, this need not mean that Plato was unaware of some of the surviving paradoxes, including those directed against motion. I find it plausible that Plato used the statement "all is one" as emblematic of Eleaticism as a whole. Saying that Zeno argued against advocates of plurality then becomes simply a way of expressing what is true – Zeno argued against views that contradict any of the tenets of Eleaticism. If so, then all the surviving paradoxes could come from the book Plato mentions.[23]

NOTES

1 For a sceptical line on these chronological indications, see Mansfeld [32] 64–68.

2 But we cannot be certain that Zeno ever visited Athens. Diogenes Laertius (IX.28) says he never left Elea. However, Plutarch reports that Zeno instructed Pericles (*Pericles* 4.3), and Plato (*Alcibiades* I 119a) says that he earned a good deal of money teaching in Athens, which suggests at least one lengthy visit.

3 How many books did Zeno write? Plato mentions only one, and in a way that discourages us from thinking that there were others. The *Suda* lists four titles but inspires little confidence; it is even unclear which of the four is the one Plato describes. See Lee [324] 8.

4 For this reading of Zeno, see Barnes [14] 234–35.

5 Proclus, *In Parm.* 694.23–25; Elias, *In Cat.* 109.17–30.

6 This count includes the two arguments (not in DK) that Proclus attributes to Zeno in his *Commentary on Plato's Parmenides*, 769.22ff. and 862.25ff., translated and discussed in Dillon [327] and Dillon [326] respectively.

7 Barnes [14] 207.

8 See McKirahan [10] 169.

9 Barnes [14] 235.

10 Barnes [14] 236.

11 This is essentially the reconstruction of Cornford [285] 68. For other reconstructions, all of them containing fallacies, see Barnes [14] 237–38, McKirahan [10] 182–83.

12 I follow Owen [338] 46 in this interpretation of Eudemus' testimony. Others have seen in it a rejection of Parmenidean monism.

13 Simplicius reports that Zeno argued that they are "unlimited *in size*," that is, infinitely large (*In Phys.* 140.34). But the direct quotation from Zeno does not say "in size"; if we stick to the quoted text, we can reconstruct the argument so as to avoid the fallacy.

14 This argument has been seen as fundamental in the origins of fifth-century atomism. On this, see Furley [400] ch. 6 and Taylor, this volume p. 182. For Epicurus' claim that atoms have theoretically indivisible minimum parts, see Epicurus, *Letter to Herodotus* 56–59 and Furley [400] chs. 1, 8.

15 Some hold that this argument tells against Parmenides' monism too, proving that the One can be divided and so is not really one. This conclusion obtains only if Parmenides conceived of the One as spatially extended, which is a reason for adopting an interpretation of Parmenides on which the One is not extended in space. See McKirahan [10] 172–73, but Sedley, this volume p. 121, opts for the other interpretation.

16 The bibliography is immense. For a sample of philosophers' reactions to Zeno, see especially Russell [339] and [340]; Ryle [341]; Grünbaum [334]; and Salmon [328], as well as the flurry of notes on the paradoxes of motion that appeared in *Analysis* between 1951 and 1954 (see bibliography [348–55]). Barnes [14] sets the standard for careful logical dissection of the arguments.

17 I shall not discuss the fourth paradox, which is known as "The Stadium" and as "The Moving Rows" and which has been subject to widely differing interpretations. On one interpretation, the paradox is a valid argument against an atomistic conception of time (see Tannery [131]; Lee [324]; Kirk and Raven [4] (1st edn); and Owen [338]); on another it has nothing to do with such a view of time, and commits a gross logical blunder (see Furley [400], KRS [4], and Barnes [14]).

18 There is no evidence that the Dichotomy was half of an antinomy – not that this is decisive; Aristotle's particular interest in the paradox would have led him to disregard the other limb.

19 The fact that in relativistic mechanics an object in motion shrinks is obviously irrelevant to a historical interpretation of Zeno's argument.

20 For another reconstruction of the argument, which does not use these premises, see Vlastos [344] 3–18.

21 Although the usual mathematical definition requires *t* to be one of the endpoints of the interval, this formula is equivalent.

22 For the history of these interpretations of Zeno, see especially Tannery [131]; Cornford [285]; Raven [226]; and Owen [338]; and the criticisms contained in works mentioned in Barnes [14] 617 n.5 and 618 n.6.

23 I presented versions of this chapter at California State University at San Francisco and at the University of Texas at Austin. The final version has benefited from the lively discussion that on both occasions followed the talk, as well as from the comments of Jim Bogen and Sandy Grabiner, the latter of whom was an invaluable aid in mathematical matters.

DANIEL W. GRAHAM

8 Empedocles and Anaxagoras: Responses to Parmenides

There is no question that Parmenides' poem was a watershed in the history of early Greek philosophy. No serious thinker could ignore his work. And yet it seems to pose insuperable problems for cosmology and scientific inquiry. The first generation to follow Parmenides includes thinkers who wished to continue the tradition of Ionian speculation. But how would they confront Parmenides? What would they make of him and what effect would his arguments have on their work? The first neo-Ionians[1], as they have been called, were Empedocles and Anaxagoras.[2] Despite some salient differences, the two philosophers have much in common in their approach. They are near contemporaries,[3] and as we shall see, they make similar moves in their approach to scientific speculation. Let us first examine the systems of Empedocles and Anaxagoras, and then discuss their responses to Parmenides.

I. EMPEDOCLES AND ANAXAGORAS

After warning us to seek a balance in our evaluation of sensory evidence (DK 31 B3), Empedocles goes on to identify the basic constituents of the universe and to develop a cosmology based on those constituents. There are four "roots," (*rizômata*): earth, water, air, and fire (B6), which combine in whole-number ratios to form compounds. For instance, bone consists of two parts earth, four parts fire, and two parts water (B96) and blood of equal portions of the four roots (B98). The roots always exist in their own right, but they do not always appear to us because they are sometimes mixed with each other. In effect the four roots are unchanging stuffs that came to be known in antiquity as the four elements. In a striking simile, Empedocles compares nature to painters:

As when painters decorate offerings,
men well trained by wisdom in their craft,
who when they grasp colourful chemicals with their hands,
mixing them in combination, some more, some less,
from them provide forms like to all things,
creating trees and men and women,
beasts and birds and water-nourished fish,
and longlived gods mightiest in honours. (B23.1-8)

As a painter can, with a few colours, represent diverse forms of very different things, so can nature, with a few elements, create all natural substances.

In a discussion of these realities, Empedocles also introduces two personified forces, Love and Strife, with Love uniting the elements and Strife separating them (B17.19ff.). Empedocles describes Love and Strife as spatially extended but invisible. There is some controversy over how they act, but evidently Love joins unlike elements together while Strife separates them. No force seems necessary to combine for example, earth with earth, but some power is needed to make earth combine with water or air or fire. Love and Strife interact to shape the world. Love brings elements together into a harmonious arrangement, finally uniting all things into a perfectly homogeneous mixture in a cosmic Sphere (*sphairos*). Eventually, however, Strife enters into the Sphere from outside, shattering its unity and precipitating a separation of the elements. From the separated parts of the Sphere comes a cosmos in which the different masses of earth, water, air, and fire appear, and plants and animals arise. At this point there is controversy over what happens. On one account, Strife continues to separate the elements until earth, water, air, and fire are completely dissociated from each other and stratified in their concentric layers, permitting no compounds and no living things; at this point Love begins to expand from the centre of the cosmic Sphere and again forms compounds including living things.[4] Fragment B35 seems to suggest this view:

...when Strife had reached the innermost depth
of the vortex, and Love comes to be in the middle of the circle,

there all these things come together to be one only,
not suddenly, but willingly joining together, this from here and that from there.
And as they were being mixed, ten thousand races of beasts were poured out
but many things unmixed stood apart from those mixed,
all those that Strife still held back in midair; for not yet blamelessly
did it completely stand apart at the final limits of the circle,
but some members remained in the limbs, some moved outside them.
As far as it kept fleeing forth, so far did ever
the gentleminded blameless immortal rush of Love go on. (B35.3-13)

Love causes compounding to take place as it occupies the battlefield and Strife retreats to the periphery of the cosmos. On another account, there is never a complete separation of the elements but only an ongoing struggle between Strife and Love, which Love eventually wins as it again forms the Sphere in an unending cyclical process.[5]

On the former view, there are two separate creations of plants and animals, one during the stage when Strife is increasing, and another during the stage when Love is increasing. During the increase of Strife "whole-natured forms" emerge from earth as the cosmic separation of elements is taking place. These are gradually differentiated, at least in some cases, into viable living creatures. Later, this generation will perish as Strife completely separates every element into its own stratum. As Love begins to assert itself, first detached limbs are formed from the elements; these limbs join together in chance combinations to form monsters such as "manfaced oxkind" and "oxheaded mankind." Unable to survive, these monsters perish. But when limbs come together in viable combinations, the resulting beasts survive and reproduce. In his account of generation from limbs, Empedocles provides a kind of precursor to modern biological theories. Although he does not enunciate a theory of stepwise evolution, his theory does presuppose a principle of natural selection to account for existing species. Aristotle (*Phys.* II.8) criticizes Empedocles for assigning too great a role to chance in the production of natural kinds, but in this Empedocles is closer to modern science than is Aristotle.

Many details of Empedocles' cosmic cycle remain unclear, but it is clear that his main theme is the ceaseless alternation between the processes of union and division that produce one out of many and many out of one:

and these things never cease continually alternating,
at one time all coming together into one by Love,
at another time each being borne apart by the enmity of Strife.
Thus, inasmuch as they are wont to grow into one from more
and in turn with the one growing apart they become more
they are born and do not enjoy a steadfast life;
but inasmuch as they never cease continually alternating,
they are ever immobile in the cycle. (B17.6-13)

Empedocles recognizes the symmetry of the contrary processes of unification and division by balancing antithetical lines; he recognizes the continuity of the process by reiterations of his descriptions. In his cycle both one and many have a place. And there is a kind of changelessness manifest in the repetitions of the cycle itself, as line 13 makes explicit. Thus Empedocles posits a one and a many, motion and rest, and indeed rest in motion, as features of his dynamic world view.

In his psychology, Empedocles introduces what appear to be supernatural factors. Human beings have an everlasting soul that is exiled from its blessed abode for its sins. Wandering from place to place, it inhabits different bodies in turn until it does what is right so as to be able to escape the cycle of rebirths. This religious doctrine, perhaps influenced by Pythagorean teachings,[6] distinguishes Empedocles' philosophy from those of other neo-Ionians. There is continuing debate over whether his psychological-religious views can be reconciled with his natural philosophy. In his style, as in his philosophy, he borrows from the realm of religion. For Empedocles presents his theory of nature as well as his theory of the soul in hexameter verses – borrowing from the epic tradition as did Parmenides, echoing his language but pursuing a more florid style full of personifications, metaphors, and mythological motifs.[7]

By contrast, Anaxagoras writes sober Ionian prose in developing a more traditional kind of cosmogony. According to Anaxagoras' famous introduction, "Together were all things, boundless both in multitude and in smallness" (DK 59 B1). Out of the primeval mixture arose the cosmos when the cosmic Mind (*nous*) began a rotatory motion that separated different stuffs from each other. As heavy and moist materials gathered in the centre and light and dry materials were carried to the circumference, the delineations of the world began to emerge. Some heavy objects were carried around with the whirl and ignited by friction to form the heavenly bodies. The vortex motion continues expanding within the boundless universe, but there is no cyclical formation and destruction of the cosmos as in Empedocles, only an ongoing expansion.

As best we can tell from the meagre details of the fragments, Anaxagoras admitted an indefinite number of different substances as the building blocks of his cosmos. He mentions air, aither (the fiery upper air) and earth as examples (B1, B4), and ancient sources add biological tissues and substances such as blood, flesh, and bone. Anaxagoras speaks also of contrary qualities such as hot and cold, wet and dry, light and dark in the same context as the substances (B4). Some modern interpreters have sought to account for such substances as flesh and blood as combinations of the contraries, in a way analogous to Empedocles' combinations of elements to form compounds – that is, they envisage flesh as a certain combination of hot and cold, wet and dry, light and dark, and so on, in determinate proportions.[8] But there is no textual evidence for such a reduction, and it is at least consistent with what Anaxagoras says that the contraries should be thought of as substances like earth and air. Thus he seems to posit as many elements as there are material stuffs, and perhaps as there are qualitatively determinate kinds of stuff. He reiterates the principle that everything is mixed with everything – presumably meaning that every stuff is intermixed with every other stuff, with only one exception: Mind (*nous*) is distinct from all other stuffs and is found only in some things, presumably in animate objects, without ever being mixed with them (B12). It understands and rules all things.

Five postulates have been identified as characterizing Anaxagoras' physical theory:[9]

(1) According to the postulate of No Becoming, no substance comes into being or perishes.
(2) Universal Mixture maintains that everything is in everything.
(3) By Infinite Divisibility, matter can be divided ad infinitum.
(4) Predominance asserts that the substance that supplies the greatest quantity of a mixture has its qualities predominate in the resulting substance.
(5) According to Homoiomereity, each substance is composed of

portions of exactly the same character, that is, it is homogeneous through and through.

There is evidence in the fragments for all of these postulates except the last. Anaxagoras' elements are often taken to be completely homogeneous because Aristotle calls them *homoiomerê* (having parts like the whole). Aristotle's *homoiomerê* are stuffs (he is especially interested in tissues of living things) that can be divided into portions of the same kind of stuff, as a portion of blood that can be divided into smaller portions of blood. But it is unclear whether Aristotle is explaining Anaxagoras' elements as homogeneous or simply identifying them as those things which in Aristotle's system, but not necessarily in Anaxagoras', are in fact homogeneous, for example, flesh and blood. The only thing that Anaxagoras explicitly identifies as homogeneous is Mind, which he goes on to contrast with the variability of the elements (B12, end).[10] Thus the last postulate must remain controversial.[11] But clearly, Anaxagoras holds to the others, and it can be shown that the first four are not inconsistent with each other.[12] Anaxagoras develops a theory in which there is a strong mixture of all things, which seems to continue to the microscopic level without end. Components of the mixture are everlasting elements that manifest themselves when they predominate quantitatively in a local mixture. Quantities of elements can vary from place to place, but some trace of every element is found in every place.

Although many details remain obscure in the systems of Empedocles and Anaxagoras, we can perceive important similarities in their physical theories. Both posit element-like substances as the basic constituents of the universe. Early Ionian systems, in contrast, seem to posit basic substances that are transformed into one another, for instance Anaximenes' air turns into fire when rarefied, and wind, cloud, water, earth, and stones, successively when condensed.[13] And they often treat the forces that drive change as internal to their basic substance, as Anaximenes' air and Heraclitus' fire are thought to have a motive power of their own.[14] But Empedocles and Anaxagoras identify external forces that act on the elements: Love and Strife for the former, Mind, for the latter. Thus they recognize a distinction between the relatively inert elements and the active forces that drive them. To be sure, the forces are not yet fully abstracted from the matter: they occupy space like physical bodies on the one hand and are identified with spiritual attributes on the other.[15] They constitute a unique type of physical-spiritual being, but not yet a categorically distinct type of entity.

Empedocles and Anaxagoras also appeal to a model of mixture to account for the way elements interact with one another. In some way, the interaction of elements is like, say, what happens when liquids such as water and wine mix together. Various ingredients go into the mixture and a distinctive material emerges. Whereas the early Ionians envisage a single dynamic substance that changes into other substances in a cycle of transformations, Empedocles and Anaxagoras posit a plurality of substances of fixed natures that interact in different proportions to produce mixed substances. In their conception one can at least theoretically distinguish between the basic constituents and the resultant mixtures, between element and compound, between pure and phenomenal substance.

II. PARMENIDES' INFLUENCE

We must now turn back to Parmenides and his influence on Empedocles and Anaxagoras. Parmenides had stated that there are two ways of inquiry that can be thought, that (it) is or that (it) is not. But the latter is an impossible way because it is unsayable and unknowable, so that only the former way is acceptable. Coming to be is impossible because it presupposes a change from what-is-not to what-is, and hence it presupposes not-being. Differentiation is ruled out because it involves a contrast between what-is and what-is-not. Motion is impossible because it presupposes coming to be. What-is cannot be incomplete because then it would presuppose what-is-not. Parmenides goes on to develop a deceptive cosmology which he criticizes at the outset as involving a fallacy (B8.50-52). If this cosmology, which is the best that can be devised, fails, (*a fortiori*) all other cosmologies fail.

Parmenides' argument against change is relentless, but its implications are far from clear. How are we to take his points? And, more important, how did Empedocles and Anaxagoras take them? We do have a record of ancient views on Parmenides. Plato and Aristotle take it that Parmenides (and the members of his "school," the Eleatics)[16] were monists: that is, they maintain that there was just one reality, namely Being. In an ancient debate about motion they argue against Heraclitus and his followers, who held that everything is in motion, that rather everything is at rest.[17] To save the appearances, the pluralists Empedocles, Anaxagoras, and the atomists posit a plurality of beings that can interact.[18]

Now there are some problems with this view. In the first place, Parmenides does not expressly argue for monism.[19] It is true that on a certain reading, monism would follow from his theory: if all there is is what-is, and if what-is is something determinate, then there is only one thing; but Parmenides himself argues rather against dualism (in the second half of his poem) than for monism.[20] Furthermore, it is difficult to find a theory to which Parmenides is reacting.[21] In any case, the ancient sources did not fully appreciate the role of Parmenides in restructuring the terms of the ancient debate, and hence they are not wholly reliable as informants about what was going on. They seem to have pictured the ancient conflict as a fixed debate between several dogmatic schools rather than as a dynamic interaction.

It is an accomplishment of twentieth-century history of philosophy to see that Parmenides did change the way the issues were conceived. According to the dominant view, Parmenides argued effectively against all motion and change, attacking the very foundations of Ionian natural philosophy. In a desperate attempt to rescue cosmology, Empedocles and Anaxagoras conceded that coming to be and perishing are impossible, but they allowed arrangement and rearrangement of elements which have the Eleatic properties of being everlasting and unchanging in their natures. Unfortunately, they merely begged the question because they never established the theoretical possibility of the limited kinds of change they allow. The atomists are often praised for their willingness to confront the problem directly by admitting that what-is-not exists, in the form of a void or empty space in which motion can take place. Hence they succeeded in providing a theoretical possibility of change where Empedocles and Anaxagoras failed.

This view, though still widely held,[22] runs into serious problems. Consider how Empedocles and Anaxagoras respond to Parmenides:

...there is no birth [*physis*] of any of all
mortal things, neither any end of destructive death,
but only mixture and separation of mixed things
exist, and birth is a term applied to them by men. (Empedocles, DK 31 B8)

when things being mixed in the form of man arrive into the bright light
or in the form of the race of wild beasts or of bushes
or of birds, then men call it being born
and when they are separated, ill-fated destruction;
what is proper they do not call it, but by custom I speak so myself. (B9)

Fools! For not far-reaching are their thoughts,
who expect what was not before to come to be
or that something dies and perishes completely. (B11)

For from not being at all it is impossible for something to come to be [or: be born],
and for what is to be destroyed is impossible and unheard of.
For always it will be there, wherever anyone sets it. (B12)

Coming to be and perishing the Greeks do not rightly understand; for no thing comes to be or perishes, but from existing things it is mixed and separated. And thus one would rightly call coming to be mixture and perishing separation. (Anaxagoras, DK 59 B17)

Both Empedocles and Anaxagoras wholeheartedly endorse Parmenides' rejection of coming to be and perishing, without qualification or implied criticism. And neither one ever argues explicitly against him in the fragments on any other issue.[23] Nor do we find evidence in ancient sources (who were interested in debates between rival schools) that they criticized Parmenides.[24] Why not? Where is the evidence that they were desperately trying to save cosmology against his onslaught? Modern interpreters have assumed that (1) Parmenides argued against all change, (2) Empedocles and Anaxagoras read him as arguing against all change, and hence (3) they must have opposed Parmenides. There is, however, no explicit evidence for (2), and if (2) is false, (3) will not follow. One possibility is that both (1) and (2) are true, but that, like good scientists, Empedocles and Anaxagoras simply dismiss Parmenides' arguments as too abstractly philosophical and continue on with the project of explaining the cosmos.[25] But the dichotomy between science and philosophy seems anachronistic, and, moreover, the fact that they accept Parmenides' rejection of coming to be and perishing belies the claim that his arguments are too abstractly philosophical. If they explicitly accept part of Parmenides' theory, they owe us a reasoned rejection of the part they reject.

Empedocles and Anaxagoras agree with Parmenides without explicitly disagreeing. On the standard view we should expect disagreement; on the view that they are merely pursuing a scientific program we should not expect the agreement. Can we account for their attitude as expressed in the fragments? I believe we can. We must simply reject (2). But how could we do that? We must note that Parmenides' poem is difficult to interpret, and it was no less so in his own time than in ours. Although we have so far assumed that there is a straightforward reading of the text, in fact, modern interpreters have taken it in different ways. One possible reading is that in rejecting what-is-not, Parmenides is developing a radical cosmology, in which there is just one substance, what-is, and no change. This interpretation seems embodied in the ancient view of Parmenides as a monist. It is also possible that Parmenides is criticizing beliefs in change and differentiation without substituting a new kind of ultimate substance in the world. What-is, whatever it is, must conform to the canons of Eleatic being: it must be everlasting, all alike, unchangeable, complete. On this reading, Parmenides is the first metaphysician instead of the latest cosmologist. He is telling what something would have to be like in order to qualify as an explanatory principle. This interpretation may sound too Kantian in its aim to find the presuppositions of scientific explanation. But it makes sense as an account of what could be meant by the otherwise bizarre claims that there is no change and no difference.

Moreover, this interpretation allows us to take into account the second half of Parmenides' poem, in which he develops a cosmology of his own. Granted, Parmenides does make a disclaimer when he introduces the cosmology (DK 28 B8.50-52). He goes on to offer a diagnosis (lines 53–54), but it is not clear precisely what his diagnosis is, and further, whether he is opposing cosmology in principle or just the inadequate ontology on which mortals base their cosmologies.[26] On one reading he says: "[Mortals] have made up their minds to name two forms, of which it is not right to name one – in which they have gone astray." Could it be that the reason one contrary form should not be named is that it is conceived as derivative from the other? If fire is basic for Heraclitus, that is, the hot, dry, light principle, then what is cold, wet, heavy will not exist in its own right. Indeed, one might ask how the latter could exist at all if what-is consists of the hot and dry and nothing else. Perhaps then the mistake mortals commit is to produce a cosmology depending on two contrary principles, while taking their two principles as interdependent contraries. If instead we take them as independent and "equal" realities, as Parmenides does in B9, we can produce a satisfactory account of nature. When Parmenides recommends his cosmology as better than any other (B8.60-61), one could understand this as a blanket endorsement of his natural philosophy, or at least of his method of inquiry.

Here, as elsewhere, Parmenides' hexameters produce an argument that is suggestive rather than demonstrative, full of ambiguities and alternative readings rather than perspicuous. As acute a student of the early Greek philosophers as Aristotle could take Parmenides' cosmology to be a serious account of reality.[27] One might read the second half of the poem, then, not as providing a deceptive cosmology, but as sketching a program for the right kind of cosmology. I am not arguing that such a reading is the correct one, only that it is a possible one, and one, moreover, that it is historically plausible to attribute to Empedocles and Anaxagoras.[28]

III. THE PARMENIDEAN MODEL OF EXPLANATION

From the first half of Parmenides' poem one learns that what-is must be (1) everlasting, (2) all alike, (3) unchanging in its nature, and (4) complete. From the second half, one sees that what-is (5) constitutes a dualism, and (6) embodies a contrariety (7) of independent entities that are (8) equal to one another. Parmenides' criticism of mortal cosmologies could be read as an attack on (5) in which Parmenides criticizes mortals for taking not-being as one of the two contraries.[29] If then we reject a dualism between being and not-being, we leave open the option of a pluralism of equal and independent entities. Pluralism becomes a successor theory to a problematic dualism.

The one serious challenge for a pluralistic interpretation is how to take the property of being all alike (2) in such a way that the allegedly distinct entities do not collapse into a unity. In Parmenides' most explicit discussion, B8.22-25, he says that (it) is all alike because there is no more or less of it in one place than in another, but all is full of what-is. Now if we take "what-is" as expressing some definite reality, it will turn out that the indefinite subject of our discussion is both quantitatively and qualitatively uniform, and hence, by Leibniz's Law, any part of it is indistinguishable from any other part, and all the alleged parts of being will collapse into a single being. But if we take "what-is" as not referring to any particular kind of thing, including Being (whatever that is), but only as a place-holder for whatever we determine to be real, then it will not follow that the world consists of a uniform substance. It will be sufficient if what-is, whatever it is, is internally uniform, that is, if it is quantitatively distributed in a uniform way, wherever it is. But nothing precludes the possibility of there being several types of reality, each one of which is internally uniform. While the latter reading is not the most obvious one, it is not obviously false either, and there is some sense in which it might be viewed as the most sophisticated and charitable one to take.[30]

On this reading, a pluralist cosmology is not a desperate alternative to Parmenides' cosmic monism, but an intelligent development of the programme laid down by Parmenides himself. No critical reply to Parmenides is necessary, for the pluralist cosmologist is not a rival to Parmenides but a follower of his theory and a practitioner of his method. Parmenides concludes the introduction to his poem with the words:

...You must learn all things,
both the unshaken heart of persuasive [or: well-rounded] truth
and the opinions of mortals, in which there is no true reliability.
But nevertheless you will learn these things too, how appearances
must be acceptably, all of them pervading everything. (B1.28-32)

In accordance with a constructive reading of the second half of the poem, we might construe his remarks as follows: you must learn both the changeless principles of nature, and the ways in which their interaction produces the changing phenomena of nature. Although the latter study does not yield certainty, it can yield understanding of the appropriate sort. We must formally distinguish (for the first time) between metaphysics and physics. In the second half of his poem, Parmenides allows phenomena that come to be (*gignesthai*) as explananda (B11), and, following his principles, so can his would-be followers.

Now in fact, the elements of Empedocles and Anaxagoras conform to the principles one can extract from Parmenides. They are (1) everlasting, (2) of a single nature, (3) unchanging in their natures, (4) complete in the sense of not requiring something to realize them. They constitute not (5) a dualism (which Parmenides may be taken to be criticizing) but (5a) a pluralism, (6) which does, however, incorporate (but does not consist of) contrarieties. Furthermore, the elements are (7) independent of one another and (8) equal to one another. Thus it does appear that the theories of Empedocles and Anaxagoras can be seen as embodying constructive suggestions of Parmenides.

The dominant model of explanation of Empedocles and Anaxagoras is mixture. The elements mix together to produce phenomenal objects. The ingredients of the mixture preexist and will continue to exist after the mixture itself ceases, while the mixture produced is a temporary state of interaction of everlasting constituents. At the ultimate level of description, the mixture does not exist, but only the changeless elements themselves. Yet at another level their interaction does produce changing events. We can distinguish between a changeless Eleatic world of elements and a changing world of events. Those events are derivative and hence in some sense not real – that is, not ultimate principles of explanation. But neither are they mere illusions. They are derivative states of the ultimate principles. The model provides a distinction between the ultimate and the derivative, the real and the phenomenal. For Empedocles and Anaxagoras, deception would consist not in inventing an illusory world but in thinking that the properties of phenomenal objects are the ultimate properties of things. For instance, it would be a mistake to think that the ultimate realities come into being and perish because plants and animals, tables and chairs, come to be and perish.

Between the early Ionians and the pluralists, a major shift has taken place. The early Ionian model envisages a single stuff as being transformed into many different substances. Anaximenes' air becomes fire when rarefied, or wind, cloud, water, earth, and stones when condensed to the appropriate degree.[31] There seems to be a genuine sense in which Anaximenes' air and Heraclitus' fire come into being and perish and in which other substances become complete by turning into air or fire. By virtue of the fact that their original substance becomes all things, it cannot be anything permanently. The pluralist takes a stand against the early Ionian world-view by insisting that there are certain Eleatic laws, as it were, which govern the real. These laws rule out the possibility that the ultimate principles are themselves subject to change, that they come to be and perish, or that they can turn into other substances or develop into a completed state.

Moreover, by identifying the ultimate stuffs as changeless beings, the pluralists have taken a major step in the direction of distinguishing between agent and patient, mind and matter, soul and body. Whereas the earlier Ionians had tended to attribute agency and power to their ultimate substance, the pluralists isolate agency from substances. Empedocles posits Love and Strife, Anaxagoras a cosmic Mind. Empedocles also recognizes an everlasting soul apart from the material elements. Although neither Empedocles nor Anaxagoras can be credited with (or blamed for) producing a full-blown agent-patient or mind-body dualism (Anaxagoras' Mind still has physical properties such as homogeneity and spatial location), they move in the direction of those distinctions. There is still no strict distinction between substance and properties, as we can see by the way Anaxagoras seems to conflate stuffs and qualities. But he and Empedocles do show a growing awareness of the difference between material and mental entities and between movers and moveds. The distinction between a thing and its affections will not appear in philosophical literature until Plato, and the categorial distinction between substance and property until Aristotle.[32] Aristotle will finally co-opt a word originally meaning "wood" or "building material," *hylê*, for matter – a concept the early Greek philosophers deal with constantly without being able to refer to abstractly.[33]

IV. ELEATIC OBJECTIONS

The conceptual advances Empedocles and Anaxagoras have made are inspired by Parmenidean considerations. Their realities are more substantial than those of the early Ionians: they are everlasting beings with fixed natures and properties. Though they do not change in themselves, they change in their relationships to other things, namely other basic substances. It is here that the early pluralists are most vulnerable to Eleatic objections: how can there be any change in the relationships of basic substances to each other? For to change in their relationships, they will have to change in their configurations in some way or another. Minimally, they will have to change in their spatial location so that they can mix in different proportions, which in turn will result in the appearance of different phenomenal properties. But if one rules out the possibility of motion in place, then one will block the pluralist solution to the problem of change. Furthermore, one can object to the status of a new relationship, a new configuration of substances as presupposing the appearance of some new situation where one did not exist before – thus violating the principle of No Becoming recognized by both Empedocles and Anaxagoras.

Both of these problems appear in the second generation of Eleatic objections. Zeno of Elea has a series of arguments that seem to focus on the impossibility of motion. And Melissus explicitly objects that the appearance of a new configuration violates Parmenides' strictures against something coming to be from what is not.[34] It is not clear what the chronological relationships are between the two pluralists and the new generation of Eleatics. But we can reasonably ask how vulnerable the theories of Empedocles and Anaxagoras are to the new Eleatic objections, whether or not they were confronted with them historically. It appears that neither has much to say in reply to objections about the impossibility of motion. Objections against motion, indeed, seem to appear in the second argument of Parmenides' fragment B8, so they are not new, however new Zeno's paradoxes may be. One can perhaps see in Empedocles and Anaxagoras a tendency to stress not locomotion but the omnipresence of the elements: Empedocles portrays the elements as roots and maintains that they "run through all things"[35] as though the compound is a cord made of twisted strands. Anaxagoras stresses the fact that everything is in everything, that is, that no substance is devoid of every element. These remarks divert attention from the problem of locomotion, but they do not solve it because both philosophers presuppose that the concentration of a given element in a mixture is subject to change. This in turn presupposes that portions of the elements change place.[36]

As to the appearance of new configurations, Empedocles clearly must admit them: when new proportions of elements come about, new compounds are created. Empedocles seems to discount the importance of this situation by stressing the fact that what is real is not the compounds which come and go, but the elements themselves, which are everlasting. While he does not want to say that compounds are merely illusions, he does want to make it clear that they do not qualify as real constituents of the world. Empedocles settles for an Eleatic ontology that results in a non-Eleatic world of phenomena.

Anaxagoras allows for changing ratios of elements, but he does not admit the appearance of any new substances: the phenomenal substance we experience is just the set of elements (of which there is an indefinitely large number). But there is no emergence of new properties, no supervenience of a new property on a configuration of substances. Every phenomenal property we experience is already there in the set of ultimate realities, as a complete survey of them would show. Phenomenal properties do not really *emerge*, they *become manifest* when their bearers come to predominate in the mixture. Thus Anaxagoras minimizes the scope of novelty in the world. He does so at the price of having an indefinitely large number of elements. But in return he gains a solid defence against the charge that new configurations come into being. Melissus would no doubt object that even the becoming manifest of an already existent feature involves a change that reason must rule out. Anaxagoras, however, could point out that he has posited the absolute minimum change necessary to support a world of experience. In any case, it is not clear that the coming to be manifest of a property is a case of coming to be in the sense Parmenides has ruled out. For no *thing* has come to be. Anaxagoras has made the primeval chaos to be a reservoir containing in a latent state all substances that can appear.[37] The only novelty to be found in the world is not the creation of something new but the becoming manifest of something latent, the "separation off" of something in the mixture. Moreover, each change in the cosmos is in principle the same kind of change: some substance latent in a mixture becomes manifest; for example, when water evaporates, air that was latent in the water separates off. In this world there is change, but no change of substances, not even that of elements producing a compound (as in Empedocles): there is only the separation – which for Anaxagoras is always a partial separation – of one element from the others. Thus the relative concentrations of the elements change, which presupposes some spatial translation, but there is no other kind of change at the basic level of ontological description.

Are Empedocles and Anaxagoras successful? Both provide ingenious and powerful constructions along the lines suggested by Parmenides: they posit everlasting entities with fixed natures which, in accordance with the Way of Opinion, embody diverse qualities. Empedocles' chemistry is economical and elegant, capable of accounting for countless substances by appealing to variable configurations of just four building blocks. Anaxagoras' chemistry is uneconomical but stolidly Eleatic, listing among its outputs precisely those substances that are its inputs. There is no explanatory simplification, but there are also no supervenient properties to explain away.

Do these theories stand up to criticisms by Zeno and Melissus? Against Zeno's problems concerning the divisibility of matter, Anaxagoras adopts a defensible alternative: matter is divisible through and through. Neither Empedocles nor Anaxagoras seems to have a reply to Zeno's problems about motion in place. They downplay such motion, but since they ultimately presuppose it, they cannot escape the problems. Against Melissus' objection that a new configuration cannot come to be, Empedocles has no reply, but Anaxagoras can at least point out that he has no new substances, but all phenomenal properties are already latent in the mixture. New configurations are merely phenomenal changes with phenomenal results. That answer does not ultimately solve the problem, but it comes as close as a natural philosopher can come without his appealing to a logical or metaphysical framework – that is, without his ceasing to be a natural philosopher.

There is perhaps an irony in the situation of philosophy in the mid-fifth century. If the pluralist reads Parmenides as laying out metaphysical conditions for the possibility of a natural philosophy, he can be a natural philosopher without doing metaphysics. If he reads Parmenides as providing a new natural philosophy with Being at its heart, he will have to reply by becoming a metaphysician to criticize that view. In fact, Parmenides' arguments brought natural philosophy to the brink of logic and metaphysics by pushing the limits of natural substance. But if it was possible to read him as providing a manual for constructing a responsible natural philosophy, as I have argued it was, then one could build on his foundations rather than searching for new foundations. Their own approach suggests that Empedocles and Anaxagoras were doing the former.

If that is right, then the history of the mid-fifth century is not a tale of desperate pluralists fighting a rear-guard action against aggressive attacks of Eleatics. It is rather of two schools fighting for control of the tradition: the neo-Ionians attempting to build an adequate natural philosophy on the foundations sketched by Parmenides, and the neo-Eleatics attempting to show that Parmenides had removed those foundations. The struggle was not so much about whether natural philosophy could be saved as about how to read Parmenides. It was a struggle about who were the real heirs of Elea. Ultimately the neo-Eleatics won that struggle so completely that the evidence of the struggle almost disappeared. But the absence of any hostility by Empedocles and Anaxagoras to Parmenides reveals where they stood. These first neo-Ionians, far from being opponents of Parmenides, should be seen as they saw themselves: as Eleatic pluralists.[38]

APPENDIX

Anaximenes is sometimes still interpreted in light of Aristotle's and Theophrastus' reading of him: air remains as a substratum or underlying substance for other substances (see for example, Barnes [14] ch. 3). But this is to apply Aristotle's theory of substratum and form to a philosopher innocent of such distinctions. Anaximenes does make air the first principle (*archê*), but for him this means not that it is always present as an Aristotelian material cause, but that at one time everything in the universe was air, that every other substance arises out of air, that somehow air controls all things. In contrast to what a post-Parmenidean would say, he holds that "boundless air is the principle, from which all things that come to be and that have come to be and will be and gods and things divine *come to be*" (Hippolytus, *Ref.* I.7.1). Theophrastus explains that air "when it is rarefied *comes to be* fire, when it is condensed wind, then cloud..." (Simplicius *In phys.* 24, 29–30). No pluralist would say that one of his primary realities *came to be* anything. Aristotle and his colleague Theophrastus are not particularly bothered by this locution because Aristotle has turned the four elements back into substances that come to be and perish (*GC* II). But it may well be just this sort of account in which one thing comes to be many other things that roused Parmenides to argue against change (see Graham [242]).

Still, how could Aristotle and Theophrastus get Anaximenes and the Ionians so wrong? In part because Aristotle was eager to cast them in the role of predecessors to himself (*Metaph.* I.3-4 *et passim*), first discovering the material cause (matter as a substratum for change), then others of his four causes. Now while it is undeniably true that the Ionians were concerned with identifying the material substance from which the world came to be, it does not at all follow that they conceived of their original stuff as a material cause in Aristotle's sense: that is, as a continuing subject of change in which forms come to be instantiated. In a similar vein, Aristotle declares that all his predecessors were asking, "What is substance?" (*Metaph.* VII.1). In one sense that is quite true: namely, if we take "substance" as a term designating the ultimate reality, whatever that is. In another sense it is false and pernicious: his predecessors were not searching blindly for *Aristotle's* conception of substance. What these cases show is that in trying to fit his predecessors into his pigeonholes Aristotle sometimes blurs the distinction between what concerns they can reasonably be said to have had and concerns that only an Aristotelian or post-Aristotelian philosopher could reasonably be said to have had.

In general I hold that it is false that Anaximenes or any other early Ionian was a "material monist," that is, that his single principle was a material cause in the strict Aristotelian sense of enduring through all changes as a subject of those changes. That he was a materialist in some sense is true, and that he was a monist in some sense is true – in the sense that there is a single principle from which all other substances come to be and which is in some sense more perfect than they and which also controls them – but that he was a material monist in Aristotle's sense is not true. The theory of material monism that Aristotle projects onto the early Ionians presupposes metaphysical principles of subject and predicate, form and matter, potentiality and actuality that are simply not part of Ionian ontology and are arguably too sophisticated ever to have been conceived of by early Ionian theorists.

NOTES

1 The term is from Barnes [14] ch. 15, who stresses the continuity of their project with that of early Ionian philosophers. The term aptly allows us to class philosophers of Italy and Sicily, such as Philolaus and Empedocles, with later philosophers from Ionia such as Anaxagoras.

2 These two philosophers seem to have been active about a generation earlier than Philolaus, Archelaus, Diogenes of Apollonia, and Leucippus, and perhaps a couple of generations earlier than Democritus.

3 On the most straightforward reading of Aristotle *Metaph.* I.3 984a11, Anaxagoras was older than Empedocles but later in publishing his work; however, the term for "later" could mean "inferior" or even "more

modern." It is controversial which published first, though similarities seem to indicate that one of them was reacting to the other (O'Brien [375]). See also the detailed reconstruction of Anaxagoras' chronology in Mansfeld [395]. In any case, the two are near contemporaries and are both reacting to Parmenides.

4 On the positions of Love and Strife, see Guthrie [16] 179, O'Brien [359] 116–17, Graham [363] 308 n. 39, O'Brien [369] 418–21.

5 Those rejecting a complete separation of the elements include Bollack [356] vol. 1; Hölscher [360]; Solmsen [361]; Long [362]; Schofield in KRS, 288 n. 1, 299–305; Osborne [364]. Those defending a complete separation include O'Brien [359] and [369]; Barnes [14] 308–11; Wright [358]; Graham [363]; Inwood [357]. If there is a complete separation of elements, there must be two periods of creation of animals and plants, one before and one after the separation; if there is no complete separation, one period of creation suffices. Much of the debate centres on how the various stages of creation identified in the fragments are to be located in the cosmic cycle. For the view that only Love is responsible for zoogony, see Broadie in this volume p. 216.

6 On Pythagorean teachings on rebirth, see Huffman in this volume, pp. 69–71. For Pythagorean influences on Empedocles, see Kingsley [105].

7 On Empedocles' poetry, see Most in this volume, p. 356.

8 Starting with Tannery [131] and Burnet [6], and followed for example, by Cornford [384] and Vlastos [392].

9 The list of five derives from Kerferd [390]. A number of earlier studies identified several of the postulates.

10 Unfortunately, it is not clear whether Anaxagoras is implying that no stretch of a stuff is like any other stretch of it, or only that no phenomenal object is like any other.

11 For the development of an alternative to homoiomereity, see Graham [387].

12 Kerferd [390]; Barnes [14] ch. 16; Graham [387].

13 Barnes [14] ch. 3 has revived the Aristotelian view that some early Ionians, including Anaximenes, were "material monists," that is, that they posited a basic substance (air, in the case of Anaximenes) which changed its qualities to produce the phenomena of other substances, but which was always present as an underlying principle for them. This view seems to be based on a misreading of the ancient evidence. See Heidel [388]; Cherniss [34] 362ff., esp. 371; Stokes [130] ch. 2; Graham [242] and appendix to this chapter; but to the contrary, see Sedley in this volume p. 123.

14 For Anaximenes: Cicero *De natura deorum* I.10.26, Aetius I.7.13; Heraclitus DK 22 B30, 64, 67.

15 See Vegetti in this volume p. 273.

16 The notion that he founded a school is likely to be anachronistic, but for convenience I shall refer to a group of like-minded philosophers by the traditional term of school.

17 Plato, *Tht.* 180d-e, *Soph.* 242c-d; Aristotle, *Phys.* II.1, *Metaph.* I.5 986b 18-25.

18 Plato, *Soph.* 242d-243a; Aristotle, *Phys.* I.1 184b18-22.

19 On this see Mourelatos [309] 130–33; Barnes [14]; and Curd [287], Curd [290]. The term "one" appears with possible implications of monism only in B8.6 and B8.54; in both cases the implication seems tenuous at best. But see Sedley in this volume p. 120.

20 Thus Mourelatos [309].

21 The ancient tradition ascribes to most of the early philosophers the view that motion is eternal; however, no fragments express this view except possibly those of Heraclitus, and it seems likely that the principle is derived from Aristotle's inference that eternal motion is presupposed by their view. Heraclitus, on the other hand, does seem to stress the eternity of process and could provide the dialectical setting for Parmenides' reaction. Previously it was thought (by Paul Tannery [131] 232–47 followed by Burnet [6] 183ff., 314–15, Cornford [285] ch. 1, and Raven [226]) that Parmenides was reacting to certain Pythagorean views. But no trace of the alleged Pythagorean views has been found (Vlastos [229] 376–77).

22 On the pluralists as responding to Parmenides' radical critique, see KRS 351; Barnes [14] 313–17. On the alleged success of the atomist reply, see KRS 433 (almost unchanged from the first edition). On the failure of the whole pluralist project, see Barnes [14] 441–42.

23 Raven (KRS 358-59) argues that Anaxagoras B1 marks a pointed rejection of Parmenidean monism, timelessness, and indivisibility. But that interpretation depends crucially on how Anaxagoras read Parmenides, a problem we shall discuss below.

24 Aristotle portrays Leucippus' atomism as a reaction to the Eleatics, *GC* I.8 325a2 ff. But as KRS, 409 n. 4, notes, the positions he is said to react to are those of Melissus, not Parmenides. At Aristotle *GC* I.2 316a13 ff., Democritus is shown arriving at his principles by a reasoned rejection of Zenonian positions. These interpretations suggest that atomism is a response to the second generation of Eleatics. And if Zeno and Melissus force a rethinking of neo-Ionian principles, it may be because *they* are responsible for the view that Parmenides is a strict monist, allowing only one single entity to exist.

25 Thus Mourelatos [118] 128–30.

26 On different readings of B8.53-54, see Mourelatos [309] 80–85. The passage resists easy interpretation even with the best tools of philology.

27 *Metaph.* I.5 986b31 ff.

28 For a reading that seems to me to come closer to Parmenides' intentions, see Long [304]. For the general position that the pluralists are trying to follow Parmenides' lead in the Way of Opinion, see now Curd [290] and A. Finkelberg, "Xenophanes' physics, Parmenides' doxa and Empedocles' theory of cosmogonical mixture," *Hermes* 125 (1997) 1–16. Curd asserts the strong view that the pluralists are correct in their reading of Parmenides. Finkelberg traces the dualism of Parmenides' cosmology back to Xenophanes.

29 As Aristotle takes the passage, *Metaph.* I.5 986b33-987a2.

30 Mourelatos [309], esp. 134–35, defends a reading of this type.

31 See Appendix, p. 176.

32 Plato, *Euthyphro* 11a, Aristotle, *Cat.* chs. 2, 4, 5.

33 See D. W. Graham, "Aristotle's discovery of matter," *AGP* 66 (1984) 37–51.

34 On the relation of Zeno's arguments to Parmenidean doctrine, see McKirahan in this volume, pp. 134, 156; for Melissus, see Sedley, pp. 130–31.

35 B17.34, 21.13, 26.3.

36 Cf. Aristotle *Phys.* VIII.9 265b17 ff.

37 A crucial question that arises in this context is, just what are Anaxagoras' seeds? Furley [385] 72–75 argues that they are biological seeds from which living things grow. If that is the case, then even plants and animals are latent in the primeval chaos. But there are many other interpretations of the seeds, and Anaxagoras' attention to their shapes (?) (*ideai*), colours, and savours (B4) at least tends to suggest that he is interested in them as loci of phenomenal qualities rather than as sources of biological generation. In any case, at least all stuffs are latent in the original mixture, and if Furley is right, even biological species are latently present.

38 The term "Eleatic pluralism" has been applied to the early atomists by R.B.B. Wardy, "Eleatic Pluralism," *AGP* 70 (1988) 125–46; I wish to apply it especially to Empedocles and Anaxagoras, reserving the possibility that the atomists, for reasons Wardy does not consider, may in some important respect be anti-Eleatic, for example, in Democritus' claim that "thing is no more than no-thing" (DK 68 B156). In some sense surely the atomists too are Eleatic pluralists, but not necessarily as thoroughly, unabashedly, perhaps ingenuously as their predecessors, because they have faced criticisms from later members of the Eleatic school.

C.C.W. TAYLOR

9 The atomists

Atomism was the creation of two thinkers of the fifth century B.C., Leucippus and Democritus. The former, attested by Aristotle, our primary source, as the founder of the theory, was a shadowy figure even in antiquity, being eclipsed by his more celebrated successor Democritus to such an extent that the theory came to be generally regarded as the work of the latter. Epicurus, who developed and popularised atomism in the late fourth and early third centuries B.C. (following in the tradition of various figures such as Nausiphanes and Anaxarchus, now little more than names), went so far as to deny that Leucippus ever existed. Only a little more is known about Democritus (see p. xix). The precise relation between Leucippus and Democritus is unclear. Plato never mentions either by name. Aristotle and his followers treat Leucippus as the founder of the theory, but also assign its basic principles to both Leucippus and Democritus; later sources tend to treat the theory as the work of Democritus alone. While it is clear that the theory originated with Leucippus, it is possible that the two collaborated to some extent and almost certain that Democritus developed the theory in a number of areas, for example, extending it to include a materialistic psychology, a sophisticated epistemology, and an account of the development of human society that laid particular stress on the human capacity to learn from chance experience.[1]

PHYSICAL PRINCIPLES

According to Aristotle (*GC* I.7-8 324a35-325a31), the atomists attempted to reconcile the observable data of plurality, motion, and change with the Eleatic denial of the possibility of coming to be or ceasing to be. Like Anaxagoras and Empedocles, they postulated unchangeable primary things, and explained apparent generation and corruption by the coming together and separation of those things. But their conceptions of the primary things and processes differed radically from those of Anaxagoras and Empedocles. For Anaxagoras the primary things were observable stuffs and properties, and for Empedocles they were the elements, earth, air, fire, and water: for both, the primary processes were mixing and separation of those primary things. By contrast, for the atomists the primary things were not properties or stuffs but physical individuals, and the primary processes were not mixing and separation but the formation and dissolution of aggregates of those individuals. Again, the basic individuals were unobservable, in contrast with the observable stuffs of Anaxagoras and the observable elements of Empedocles. Consequently, their properties could not be observed but had to be assigned to those individuals by theory.

Since the theory had to account for an assumed infinity of phenomena, it assumed an infinite number of basic individuals, while postulating as few explanatory properties as possible, specifically shape, size, spatial ordering, and orientation within a given ordering.[2] All observable bodies are aggregates of basic individuals, which must therefore be too small to be perceived.[3] These basic corpuscles are physically indivisible (*atomon*, literally uncuttable), not merely in fact but in principle; Aristotle reports (*GC* I.2 316a14-b7) an (unsound) atomistic argument, which has some affinities with one of Zeno's arguments against plurality (DK 29 B2), that if (as e.g., Anaxagoras maintained) it were theoretically possible to divide a material thing *ad infinitum*, the division must reduce the thing to nothing. This argument was supported by another for the same conclusion; atoms are theoretically indivisible because they contain no void. On this conception bodies can split only along their interstices; hence, where there are no interstices, as in an atom, no splitting is possible. (The same principle probably accounted for the immunity of the atoms to other kinds of change, such as reshaping, compression, and expansion. All were probably assumed to require displacement of matter within an atom, which is impossible without any gaps to receive the displaced matter.) It is tempting to connect the assumption that bodies can split only along their interstices with the Principle of Sufficient Reason, to which the atomists appealed as a fundamental principle of explanation – arguing, for instance that the number of atomic shapes must be infinite, because there is no more reason for an atom to have one shape than another (Simplicius, *In phys.* 28.9-10).[4] Given the total homogeneity of an atom, they may have thought, there could be no reason why it should split at any point, or in any direction, rather than any other. Hence by the Principle of Sufficient Reason, it could not split at all.

The programme of reconciling the data of perception with the demands of Eleatic theory led the atomists to posit a void or empty space (a) as that which separates atoms from one another and (b) as that in which they move. Parmenides had argued (DK 28 B.22-25) that there could not be many things if there were no void to separate them, and Melissus had argued (DK 30 B7) that there could be no motion without a void into which the moving object moves; Aristotle attests that the atomists accepted both theses (*Phys.* IV.5 213a32-34, *GC* I.8 325a27-28). To the question what it is that separates atoms from one another, and into which they move, their answer was simply "nothing." "what is not" or "the empty," which they appear to have treated as interchangeable terms. They did not, then, shrink from the conclusion that what is no more is than what is not (Aristotle, *Metaph.*I.4 985b8; Plutarch, *Adv. Col.* 1108f).[5] But the assertion that what separates distinct objects is nothing leads straight to incoherence; either there is nothing which separates those objects, in which case they are not separate from one another, or there is something which separates them, in which case "nothing" is the name of something.

We have no idea whether this challenge was actually put to the atomists, or if it were, how they might have met it. The most we can offer is the following suggestion of an appropriate defence. There is indeed something which separates any two nonadjacent atoms, namely an interval. But an interval is not any kind of *thing*: it is merely a gap, an absence of anything. So there are indeed gaps between atoms, but gaps are nothings, and when an atom moves, it moves into a gap. But that can hardly be the whole story. For the notion of an interval or gap between objects presupposes a continuous dimension in which the objects and the interval between them are alike situated. That is to say, the atomists' conception of the void cannot have been merely that of the nonbeing of a physical object; it was at least that of a gap in space, where space is conceived, however inchoately, as a continuous dimension. The atomists also claimed that the void is infinite in extent and used the term "the infinite" as another designation of it; this is most naturally interpreted as the claim that empty space is infinite in extent. They believed, then, that the universe consists of an infinitely large collection of indivisible physical objects (atoms) moving in infinite space, where space is a three-dimensional continuum of which any part may be either occupied or unoccupied.[6]

In this empty space the atoms are in a state of eternal motion. This motion is not the product of design, but is determined by an infinite series of prior atomic interactions[7] (whence two of Aristotle's principle criticisms of Democritus, that he eliminated final causation (*GA* V.8 789b2-3) and made all atomic motion "unnatural" (*De caelo* III.2 300b8-16)[8]). The theoretical role of the void in accounting for the separation of atoms from one another has an interesting implication that is recorded by Philoponus (*In phys.* 494.19-25, *In GC* 158.26-159.7). Since atoms are separated from one another by the void, they can never strictly speaking come into contact with one another. For if they did, even momentarily, there would be nothing separating them from one another. But then they would be as inseparable from one another as the inseparable parts of a single atom, whose indivisibility is attributed to the lack of void in it (see above); indeed, the two former atoms would now be parts of a single larger atom. But, the atomists held, it is impossible that two things should become one. Holding atomic fusion to be theoretically impossible, and taking it that any case of contact between atoms would be a case of fusion (since only the intervening void prevents fusion), they perhaps drew the conclusion that contact itself is theoretically impossible.[9] Hence what appears to be impact is in fact action at an extremely short distance. Rather than actually banging into one another, atoms have to be conceived as repelling one another by some sort of force transmitted through the void. Again, though no source directly attests this, the interlocking of atoms, which is the fundamental principle of the formation of aggregates, is not strictly speaking interlocking, since the principle of no contact between atoms forbids interlocking as much as impact. Just as impact has to be reconstrued as something similar to magnetic repulsion, so interlocking has to be reconstrued as quasi-magnetic attraction. If this suggestion is correct (and it is fair to point out that no ancient source other than Philoponus supports it) it is a striking fact that, whereas the post-Renaissance corpuscular philosophy that developed from Greek atomism tended to take the impossibility of action at a distance as an axiom, the original form of the theory contained the a priori thesis that all action is action at a distance. Consequently that impact, so far from giving us our most fundamental conception of physical interaction, is itself a mere appearance that disappears from the world when the description of reality is pursued with full rigour.[10]

CHANCE AND NECESSITY

While the broad outlines of the views of the atomists on these topics can be fairly readily reconstructed, there is much obscurity about the details. The atomists' universe is purposeless, mechanistic, and deterministic; every event has a cause, and causes necessitate their effects.[11] Broadly speaking the process is mechanical; ultimately, everything in the world happens as a result of atomic interaction. The process of atomic interaction has neither beginning nor end, and any particular stage of that process is causally necessitated by a preceding stage. But exactly how the atomists saw the process as operating is obscure. This obscurity is largely attributable to the fragmentary nature of the evidence that we possess, but perhaps the statement of the theory itself was not altogether free from obscurity.

The fundamental text is the single fragment of Leucippus (DK 67 B1) "Nothing happens at random, but everything from reason and by necessity." The denial that anything happens "at random" (*matên*) might well be taken in isolation to amount to an assertion that all natural events are purposive, since the adverb and its cognates frequently have the sense "in vain" (i.e., not in accordance with one's purpose) or "pointlessly." If that were the sense of not *matên* then "from reason" (*ek logou*) would most naturally be understood as "for a purpose." These renderings are, however, very unlikely. The majority of the sources follow Aristotle (*GA* V.8 789b2-3) in asserting that Democritus denied purposiveness in the natural world, explaining everything by mechanistic "necessity." A reading of Leucippus which has him assert, not merely (*contra* Democritus) that some, but that all natural events are purposive, posits a dislocation between the fundamental world-views of the two of such magnitude that we should expect it to have left some trace in the tradition.

Moreover, the attribution of all events to necessity, a central feature of the mechanistic Democritean world-view, is itself attested in the fragment of Leucippus. We ought, then, to look for an interpretation of the fragment that allows it to be consistent with Democritus' denial of final causation.

Such an interpretation is available without forcing the texts. Sometimes (e.g., Herodotus VII.103.2; Plato *Tht.* 189d) *matên* is to be rendered not as "without purpose" but as "without reason" ("in vain" and "empty" have similar ranges of application). Given that construal of *matên* "from reason" is to be construed as "for a reason," where the conception of reason is linked to that of rational explanation. The first part of the fragment ("Nothing happens at random, but everything from reason") thus asserts, not universal purposiveness in nature, but a principle that we have already seen to be pervasive in atomism, the Principle of Sufficient Reason. Instead of a radical discontinuity between Leucippus and Democritus, the fragment, thus construed, attests commitment to a principle basic to atomism. The second half ("and by necessity") makes a stronger claim, which links the notion of rational explanation to the notions of necessity and of cause. The stronger claim is that whatever happens *has to* happen, cannot but happen. This amounts to a specification of the reason whose existence is asserted in the first half of the sentence; nothing happens without a reason, and, in the case of everything that happens, the reason for which it happens is that it has to happen.[12]

There are, therefore, no chance events, that is, no events which simply happen. On the other hand, we have evidence that the atomists assigned some role to chance in the causation of events, though precisely what role is not easy to determine. Aristotle (*Phys.* II.4 196a24-28), Simplicius (*In phys.* 327.24-26, 330.14-20), and Themistius (*In phys.* 49.13-16) all say that Democritus attributed the formation of every primal cosmic swirl[13] to chance (indeed Aristotle finds a special absurdity in the theory that while events in a cosmos occur in regular causal sequences, the cosmos itself comes into being purely by chance). That might be thought to be confirmed by the statement in Diogenes Laertius' summary of Democritus' cosmology that he identified the cosmic swirl itself with necessity (IX.45). On this interpretation, the statement that everything happens by necessity is confined to events within a cosmos and states that all such events are determined by the atomic motions constituting the swirl. The swirl itself, however, is not determined by anything; it just happens. On this view necessity governs, but is local to, a world order, which itself arises by chance from a precosmic state where there is no necessity.

The recognition of pure chance is, however, inconsistent with the Principle of Sufficient Reason, which we know the atomists accepted. A reconciliation is suggested by a passage of Aetius (I.29.7) "Democritus and the Stoics say that it [i.e., chance] is a cause which is unclear to human reason," which may be read as asserting that the ascription of events to chance is a confession of ignorance of their causes, not a denial that they have causes. Some other pieces of evidence support this suggestion. Diogenes' summary of the cosmology of Leucippus (IX.30-33) concludes with the sentence "Just like the coming into being of worlds, so do their growth, decay, and destruction occur according to a certain necessity, the nature of which he does not explain." In line with his famous dictum, then, Leucippus held that all events, including the formation of worlds, happen according to necessity but was unable to say what it is that necessitates cosmic events. It is then plausible that either he himself or Democritus said that such events may *be said* to occur by chance, in the sense that we are (whether merely in fact or in principle is indeterminate) ignorant of their causes. Explanations of specific kinds of events and of particular events were governed by the principle that there are no chance events, but no attempt was made to offer explanations of the fundamental cosmic processes themselves. That need not imply that they are literally uncaused, but that they might as well be treated as such, since their actual causes are of a degree of complexity outstripping the powers of the human mind to discover.

For the atomists, then, everything happens of necessity; the identification of necessity with the mechanical forces of impact and motion may have been due to Democritus. What exactly was his view on this? Aetius reports him as identifying necessity with "impact and motion and a blow of matter" (I.26.2). Are impact and motion given equal status in this identification, or is it taken for granted that motion is always caused by prior impact? On the former construal some motion may be either uncaused or attributable to a cause other than impact. In favour of the first alternative is Aristotle's evidence (*Phys.* VIII.1 252a32-b2) that Democritus held that one should not ask for a cause of what is always the case. He might then have said that the atoms are simply always in motion. But while that principle allows him to exclude the question "What causes the atoms to be in motion?" the Principle of Sufficient Reason requires that the question "Why is any particular atom moving with any particular motion?" should have an answer, and it might appear inevitable that that answer should refer to a prior atomic collision, as is attested by various sources (e.g., Simplicius, *In phys.* 42.10-11; Alexander, *In metaph.* 36.21-25).

We have, however, to recall the evidence from Philoponus that atoms never actually collide or come into contact, with its implication that the basic physical forces are attraction and repulsion. On that view, most atomic motion is explained by the analogue of impact, namely repulsion, while the immobility of atoms relative to one another is explained by attraction, since the relative stability of atoms in an aggregate has to be explained, not by their literal interlocking but by their being held together *as if* interlocked by an attractive force operating over the tiny gaps between the atoms in the aggregate. But in addition, some form of attraction may also have explained some atomic motions; Sextus cites Democritus (*M.* VII.116-18) as holding that things of the same kind tend to congregate together, and as illustrating that by examples of the behaviour of animate (birds flocking together) and inanimate things (grains of different sorts being separated out by the action of a sieve, pebbles of different shapes being sorted together by the action of waves on a beach).

That this principle was applied to the atoms appears from Diogenes' account of the cosmogony of Leucippus where atoms of all shapes form a swirling mass from which they are then separated out "like to like." The separation out of atoms of different *sizes* could adequately be accounted for by the stronger centripetal tendency of the larger, itself a function of their greater mass. But the context in Diogenes, where the atoms have just been described as being of all shapes, with no mention so far of size, suggests that "like to like" is here to be understood as "like to like in shape." Aetius' report of Democritus' account of sound (IV.19.3) asserts that atoms of like shape congregate together, and it contains the same illustrative examples as the Sextus passage. It is plausible, though not explicitly asserted, that this same principle accounts for the formation of aggregates of spherical atoms, for example, flames.

We have, then, some evidence that Democritus' dynamics postulated three fundamental forces, a repulsive force that plays the role of impact in a conventional corpuscular theory and two kinds of attractive force, one that draws together atoms of the same shape and another that holds together atoms of different shapes in an atomic aggregate. It is plausible that he applied the term "necessity" to all three, regarding them alike as irresistible. It must, however, be acknowledged first that the evidence for this theory is extremely fragmentary and secondly that even if it is accepted we have no idea whether or how Democritus attempted to unify these forces into a unified theory. Stated thus baldly, the theory has obvious difficulties, for example, if two atoms of the same shape collide, do they rebound or stick together? If all atoms have both an attractive and a repulsive force, there must be some yet more basic principles determining what force or combination of forces determines their motion. Our sources give no hint of whether Democritus had so much as considered such questions.

EPISTEMOLOGY

While we have no evidence to suggest that Leucippus was concerned with epistemological questions, there is abundant evidence of their importance for Democritus. It is quite likely that the latter's epistemological interests were stimulated at least in part by his fellow-citizen and elder contemporary Protagoras (see pp. 302–4). Our evidence is highly problematic, in that it provides support for the attribution to Democritus of two diametrically opposed positions on the reliability of the senses. On the one hand, we have a number of passages, including some direct quotations, in which he appears to reject the senses as totally unreliable; on the other, a number of passages ascribe to him the doctrine that all appearances are true, which aligns him with Protagorean subjectivism, a position that he is reported as having explicitly rejected (Plutarch, *Adv. Col.* 1108f). The former interpretation is supported mainly by evidence from Sextus, and the latter mainly by evidence from Aristotle and his commentators, but we cannot resolve the question by simply setting aside one body of evidence in favour of the other, since (a) in the course of a few lines (*Metaph.* IV.5 1009b7-17) Aristotle reports both that Democritus says that either nothing is true, or it is unclear to us, and that he asserts that what appears in perception is necessarily true, and (b) Sextus (*M.* VII.136) ascribes some of Democritus' condemnation of the senses to a work in which "he had undertaken to give the senses control over belief." *Prima facie,* then, the evidence suggests that both interpretations reflect aspects of Democritus' thought. Was that thought, then, totally inconsistent? Or can the appearance of systematic contradiction be eliminated or at least mitigated?

The former interpretation is based on the atomists' account of the secondary qualities, whose observer-dependence Democritus seems to have been the first philosopher to recognise. Our senses present the world to us as consisting of things characterised by colour, sound, taste, smell, and so forth, but in reality the world consists of atoms moving in the void, and neither atoms nor the void are characterised by any secondary quality. We thus have a dichotomy between how things seem to us and how they are in reality, expressed in the celebrated slogan (DK 68 B9): "By convention sweet and by convention bitter, by convention hot, by convention cold, by convention colour, but in reality atoms and the void." Further, the distinction between the reality of things and the appearances which that reality presents has to be supplemented by an account of the causal processes via which we receive those appearances. Atomic aggregates affect us by emitting from their surfaces continuous streams of films of atoms which impinge on our sense organs, and the resulting perceptual states are a function of the interaction between those films and the atomic structure of the organs. For instance, for an object to be red is for it constantly to emit films of atoms of such a nature that, when those films collide with an appropriately situated perceiver, the object will look red to that perceiver.

Hence we are doubly distanced from reality; not only phenomenologically, in that things appear differently from how they are, but also causally, in that we perceive atomic aggregates via the physical intervention of other aggregates (viz. the atomic films) and the action of those latter on our sense organs. A number of fragments stress the cognitive gulf that separates us from reality: (B6) "By this principle man must know that he is removed from reality"; (B8) "Yet it will be clear that to know how each thing is in reality is impossible"; (B10) "That in reality we do not know how each thing is or is not has been shown many times"; and (B117) "In reality we know nothing, for truth is in the depths."

This evidence immediately presents a major problem of interpretation. On the one hand, B9 and associated reports stress the gulf between appearance and reality, claiming that the senses are unreliable in that they misrepresent reality. That dogmatic claim presupposes that we have some form of access to reality, which enables us to find the sensory picture unfaithful to how things are in fact. On the other hand, B6, 8, 10, and 117 make the much more radical claim that reality is totally inaccessible, thereby undercutting the thesis that there is a gulf between appearance and reality. B7, "This argument too shows that in reality we know nothing about anything, but each person's opinion is something which flows in,"[14] and the second half of B9, "In fact we know nothing firm, but what changes according to the condition of our body and of the things that enter it and come up against it," attempt uneasily to straddle the two positions, since they draw the radically sceptical conclusion from a premise about the mechanism of perception that presupposes access to the truth about that mechanism. We might conclude that Democritus simply failed to distinguish the dogmatic claim that the senses misrepresent reality from the sceptical claim that we can know nothing whatever about reality. An alternative strategy is to look for a way of interpreting the evidence that will tend to bring the two claims nearer to consonance with one another.

We can bring the two claims closer to one another if the "sceptical" fragments are interpreted as referring, not to cognitive states generally but specifically to states of sensory cognition. These fragments will then simply reiterate the thesis that we know nothing about the nature of reality *through the senses*, a thesis that is consistent with the slogan stated in the first half of B9 and that dissolves the apparent tension internal to B7 and the second half of B9. Support for that suggestion comes from consideration of the context in which Sextus quotes B6-10, namely that of Democritus' critique of the senses, of which Sextus observes: "In these passages he more or less abolishes every kind of apprehension, even if the senses are the only ones which he attacks specifically." It thus appears that Sextus understands Democritus as referring in these fragments to the senses only, though in his (i.e., Sextus') view the critique there directed against the senses in fact applies to all forms of apprehension. This is confirmed by the distinction that Sextus immediately attributes to Democritus between the "bastard" knowledge provided by the senses and the "genuine" knowledge provided by the intellect (B11). The latter is specifically said to be concerned with things that fall below the limits of sensory discrimination, and we must therefore suppose that the atomic theory itself is to be ascribed to this form of knowledge. This is supported by those passages (*M.* VIII.6-7, 56) in which Sextus associates the position of Democritus with that of Plato; both reject the senses as sources of knowledge and maintain that only intelligible things are real. For Plato, of course, the intelligible things are the Forms, whereas for Democritus they are the atoms, which are inaccessible to perception and, consequently, such that their properties are determinable only by theory.

On this interpretation the position expressed in the fragments cited by Sextus is not general scepticism, but what we might term theoretical realism. The character of the physical world is neither revealed by perception nor inaccessible to us; it is revealed by a theory which, starting from perceptual data, explains those data as appearances generated by the interaction between a world of imperceptible physical atoms and sensory mechanisms also composed of atoms. But now, as Sextus points out (*M.* VIII.56) and Democritus himself recognised (in the famous "Complaint of the Senses" (B125)), scepticism threatens once again because the theory has to take perceptual data as its starting-point. As a result, if the senses are altogether unreliable, there are no reliable data on which to base the theory, so, as the senses say to the mind in B125, "Our overthrow is a fall for you."

Commentators who read B125 as expressing commitment to scepticism on the part of Democritus[15] naturally reject the foregoing unitary interpretation. On this view B117 and B6-10 are not restricted to sensory cognition but express a full-blooded rejection of any form of knowledge, which must be seen as superseding the distinction between appearance and reality drawn in B9 (first part) and B11 and the claim to "genuine knowledge" in the latter. Yet Sextus presents B6-11 in a single context (*M.* VII.135-40) without any suggestion of a conflict within the collection. Moreover, in *PH* I.213-14 he points out that, though the sceptics resemble Democritus in appealing to phenomena of conflicting appearances, such as the honey that tastes sweet to the healthy and bitter to the sick, Democritus in fact uses those phenomena to support, not the sceptical position that it is impossible to tell how the honey is in fact, but the dogmatic position that the honey is itself neither sweet nor bitter. (I interpret the latter as the assertion that sweetness and bitterness are not intrinsic attributes of the structure of atoms which is the honey (see p. 190). Sextus, in short, sees Democritus not as a sceptic, but as a dogmatist. Indeed, Sextus does not cite B125, and it is possible that he did not know the text from which it comes; *M.* VIII.56 shows that he was aware of the problem that is dramatised in the fragment, but he clearly saw it as a difficulty for Democritus, rather than as signalling Democritus' rejection of the basis of his own theory.

At this point we should consider in what sense the theory of atomism takes the data of the senses as its starting point, and whether that role is in fact threatened by the appearance-reality gap insisted on in B9. According to Aristotle (*GC* I.2 315b6-15, I.6 325a24-26), the theory started from sensory data in the sense that its role was to save the appearances, that is, to explain all sensory data as appearances of an objective world. Both Aristotle and Philoponus (*In GC* 23.1-16) mention conflicting appearances as among the data to be saved; the theory has to explain both the honey's tasting sweet to the healthy and its tasting bitter to the sick, and neither appearance has any pretensions to represent more faithfully than the other how things are in reality. All appearances make an equal contribution to the theory. That is a position which atomism shares with Protagoras, but the latter assures the equal status of appearances by abandoning objectivity; in the Protagorean world there is nothing more to reality than the totality of equipollent appearances. For Democritus, by contrast, the reconciliation of the equipollence of appearances with the objectivity of the physical world requires the gap between appearance and reality. Without the gap, a world of equipollent appearances is inconsistent, and hence not objective. But there is no ground for denying equipollence; qua appearance, every appearance is as good as every other. Hence the task of theory is to arrive at the best description of an objective world that will satisfy the requirement of showing how all the conflicting appearances come about.[16]

So far from threatening the foundations of the theory, then, the appearance-reality gap is essential to it. In that case, what is the point of the complaint of the senses in B125? Does not that text provide conclusive evidence that Democritus believed that the gap threatened the theory, and hence (assuming that he understood his own theory) conclusive evidence against the interpretation that I am advancing? I do not think so, for the simple reason that we lack the context from which the quotation comes. The point of the complaint need not (and given the nature of Democritus' theory certainly should not) be the admission that the theory is self-refuting. It is at least as likely to be a warning against misunderstanding the account of the appearance-reality gap as requiring the abandonment of sensory evidence. We may imagine an antiempiricist opponent (Plato, say) appealing to the gap to support the claim that the senses are altogether unreliable, and should therefore be abandoned. In reply Democritus points out that the attack on the senses itself relies on sensory evidence. Sextus does indeed align Democritus with Plato in this regard (*M.* VIII.56). It is my contention, however, that when we put the Aristotelian evidence of the atomists' acceptance of the appearances as the starting-point of their theory together with all the other evidence, including the fragments, we have to conclude that the picture of Democritus as a failed Platonist is a misunderstanding. The atomists' distinction between appearance and reality does not involve "doing away with sensible things"; on the contrary, appearances are fundamental to the theory, first as providing the data that the theory has to explain and secondly as providing the primary application for the observationally based terminology that is used to describe the nature and behaviour of the entities posited by the theory.[17]

A final objection, however, comes from Aristotle himself, who describes Democritus as concluding from conflicting appearances "that either nothing is true, or it is unclear to us" (*Metaph.* IV.5 1009b11-12). This is a very puzzling passage, for a number of reasons. Aristotle is explaining why some people go along with Protagoras in believing that whatever seems to be the case is so, and in the immediate context (1009a38 ff.) he cites the phenomena of conflicting appearances and the lack of a decisive criterion for choosing between them as conducing to that belief. But at B9 he shifts from the thought that conflicting appearances lead to the view that all appearances are true to the sceptical account of those phenomena, namely that it is unclear which of the appearances is true or false, "for this is no more true than that, but they are alike." This, Aristotle says (i.e., the belief that none of the appearances is truer than any other) is why Democritus said that either nothing is true, or it is unclear to us. So Democritus is represented as posing a choice of adopting either the dogmatic stance that none of the appearances is true, or the sceptical stance that it is unclear (which is true). Yet, in the next sentence Aristotle says that because Democritus and others assimilate thought to perception, they hold that what appears in perception is necessarily true (cf. *GC* I 315b9 they (i.e., Leucippus and Democritus) thought that the truth was in appearance). So unless Aristotle is radically confused, the disjunction "either none of the appearances is true, or it is unclear to us" must be consistent with the thesis that all perceptions are true. If "it is unclear to us" is read as "it is unclear to us which is true," then the claims are inconsistent.

I suggest, however, that what Democritus said was to the effect that either nothing is true, or it (i.e., the truth) is unclear. The first alternative he plainly rejected, so he maintained the second. And that is precisely what he maintains in B117: the truth (about the atoms and the void) is in the depths, that is, it is not apparent in perception – it is unclear (*adêlon*) in the sense that it is not plain to see. That he used the term *adêlon* to apply to atoms and the void is attested by Sextus (*M.* VII.140), who cites Diotimus as evidence for Democritus' holding that the appearances are the criterion for the things that are unclear and approving Anaxagoras' slogan "the appearances are the sight of the things that are unclear." The truth, then, that is, the real nature of things, is unclear (i.e., nonevident), but all perceptions are true in that all are equipollent and indispensable to theory.

If that is what Democritus held, then it may reasonably be said that "true" is the wrong word to characterise the role of appearances in his theory. "All appearances are equipollent" is equally compatible with "All appearances are false," and in view of his insistence on the nonevident character of the truth, it would surely have been less misleading for him to say the latter. Though there are some difficult issues here, I shall not argue the point, since I am not concerned with defending Democritus' thesis that all appearances are true. I do, however, accept that he actually maintained that thesis and have sought to explain why he did and how he held it together with (a) his rejection of Protagorean subjectivism and (b) the views expressed in the fragments cited by Sextus.

The atomists' account of appearances depends on the whole theory of perception of which it is part, and that in turn on their theory of human nature, and ultimately of the natural world as a whole. The theory is entirely speculative, since it posits as explanatory entities microscopic structures of whose existence and nature there could be no experimental confirmation. Developments in sciences such as neurophysiology have revised our conceptions of the structures underlying perceptual phenomena to such an extent that modern accounts would have been unrecognisable to Leucippus or Democritus; but the basic intuitions of ancient atomism, that appearances are to be explained at the level of the internal structure of the perceiver and of the perceived object, and that the ideal of science is to incorporate the description of those structures within the scope of a unified theory of the nature of matter, have stood the test of time.

PSYCHOLOGY

Democritus' uncompromising materialism extended to his psychology. Though there is some conflict in the sources, the best evidence is that he drew no distinction between the rational soul or mind and the nonrational soul or life principle, giving a single account of both as a physical structure of spherical atoms permeating the entire body. This theory of the identity of soul and mind extended beyond identity of physical structure to identity of function, in that Democritus explained thought, the activity of the rational soul, by the same process as that by which he explained perception, one of the activities of the sensitive or nonrational soul. Both are produced by the impact on the soul of extremely fine, fast-moving films of atoms (*eidôla*) constantly emitted in continuous streams by the surfaces of everything around us. This theory combines a causal account of both perception and thought with a crude pictorial view of thought. The paradigm case of perception is vision; seeing something and thinking of something both consist in picturing the thing seen or thought of, and picturing consists in having a series of actual physical pictures of the thing impinge on one's soul. While this assimilation of thought to experience has some affinites with classical empiricism, it differs in the crucial respect that whereas the basic doctrine of empiricism is that thought derives from experience, for Democritus thought is a form of experience, or, more precisely, the categories of thought and experience are insufficiently differentiated to allow one to be characterised as more fundamental than the other. Among other difficulties, this theory faces the problem of accounting for the distinction, central to Democritus' epistemology, between perception of the observable properties of atomic aggregates and thought of the unobservable structure of those aggregates. We have no knowledge of how, if at all, Democritus attempted to deal with this problem.[18]

ETHICS AND POLITICS

The evidence for Democritus' ethical views differs radically from that for the areas just discussed, since while the ethical doxography is meagre, our sources preserve a large body of purported quotations on ethical topics: the great majority from two collections, that of Stobaeus (fifth century A.D.) and a collection entitled *The sayings of Democrates*. While the bulk of this material is probably Democritean in origin, the existing quotations represent a long process of excerpting and paraphrase, making it difficult to determine how close any particular saying is to Democritus' own words. Various features of style and content suggest that Stobaeus' collection of maxims contains a greater proportion of authentically Democritean material than does the collection which passes under the name of "Democrates."[19]

Subject to the limitations imposed by the nature of this material, we can draw some tentative conclusions about Democritus' ethical views. He was engaged with the wide-ranging contemporary debates on individual and social ethics of which we have evidence from Plato and other sources. On what Socrates presents as the fundamental question in ethics, "How should one live?" (Plato, *Gorg.* 500c, *Rep.* I 352d), Democritus is the earliest thinker reported as having explicitly posited a supreme good or goal, which he called "cheerfulness" or "well-being" and which he appears to have identified with the untroubled enjoyment of life. It is reasonable to suppose that he shared the presumption of the primacy of self-interest which is common both to the Platonic Socrates and to his immoralist opponents, Callicles and Thrasymachus. Having identified the ultimate human interest with cheerfulness, the evidence of the testimonia and the fragments is that he thought that it was to be achieved by moderation, including moderation in the pursuit of pleasures, by discrimination of useful from harmful pleasures, and by conformity to conventional morality. The upshot is a recommendation to a life of moderate, enlightened hedonism, which has some affinities with the life recommended by Socrates (whether in his own person or as representing ordinary enlightened views is disputed) in Plato's *Protagoras*, and, more obviously, with the Epicurean ideal of which it was the forerunner.[20]

An interesting feature of the fragments is the frequent stress on individual conscience, or sense of shame.[21] Some fragments stress the pleasures of a good conscience and the torments of a bad one (B174, B215) while others recommend that one should be motivated by one's internal sense of shame rather than by concern for the opinion of others (B244, B264, B84). This theme may well reflect the interest, discernible in contemporary debates, in what later came to be known as the question of the sanctions of morality. A recurrent theme in criticisms of conventional morality was that, since the enforcement of morality rests on conventions, someone who can escape conventional sanctions, for example, by doing wrong in secret, has no reason to comply with moral demands.[22] A defender of conventional morality who, like Democritus and Plato, accepts the primacy of self-interest therefore faces the challenge of showing, in one way or another, that self-interest is best promoted by the observance of conventional moral precepts. Democritus seems to have attempted this both by appeal to divine sanctions (not *post mortem*, since for the atomists the soul-atoms were scattered on the death of the body, but in the form of misfortunes occurring during life, B175), and by appeal to the "internal sanction" of conscience. Democritus seems to have been the earliest thinker to make the latter central to his attempt to derive morality from self-interest, thus opening up a path followed by others including Butler and J.S. Mill.

The attempt, however pursued, to ground morality in self-interest involves the rejection of the antithesis between law or convention (*nomos*) and nature (*physis*) that underlies much criticism of morality in the fifth and fourth centuries. For Antiphon, Callicles, Thrasymachus, and Glaucon, nature prompts one to seek one's own interest while law and convention seek, more or less successfully, to inhibit one from doing so. But if one's long-term interest is the attainment of a pleasant life, and if the natural consequences of wrong-doing, including ill health, insecurity, and the pangs of conscience, give one an unpleasant life, while the natural consequences of right-doing give one a contrastingly pleasant life, then nature and convention point in the same direction, not in opposite directions as the critics of morality had alleged. (We have no evidence whether

Democritus had considered the objections that conscience is a product of convention, and that exhorting people to develop their conscience assumes that it must be.) Though the texts contain no express mention of the *nomos-physis* contrast itself, several of them refer to law in such a way as to suggest rejection of the antithesis. B248 asserts that the aim of law is to benefit people, thus contradicting Glaucon's claim (Plato, *Rep.* II 359c) that law constrains people contrary to their natural bent. B248 is supplemented and explained by B245; laws interfere with people's living as they please only to stop them from harming one another, to which they are prompted by envy. So law frees people from the aggression of others, thus benefiting them by giving them the opportunity to follow the promptings of nature towards their own advantage. The strongest expression of the integration of *nomos* and *physis* is found in B252: the city's being well run is the greatest good, and if it is preserved everything is preserved, while if it is destroyed everything is destroyed. That is to say, a stable community is necessary for the attainment of that well-being which is nature's goal for us. This quotation encapsulates the central point in the defence of *nomos* (emphasised in Protagoras' myth (Plato, *Prot.* 322a-323a)) that law and civilization are not contrary to nature but required for human nature to flourish; that point is also central to the Epicurean account of the development of civilization (see especially Lucretius V).[23]

CONCLUSION

Atomism can thus be seen as a multifaceted phenomenon, linked in a variety of ways to various doctrines, both preceding, contemporary, and subsequent. Atomistic physics is one of a number of attempts to accommodate the Ionian tradition of comprehensive natural philosophy to the demands of Eleatic logic. Atomistic epistemology takes up the challenge of Protagorean subjectivism, breaks new ground in its treatment of the relation of appearance to reality and constitutes a pioneering attempt to grapple with the challenge of scepticism. Atomistic ethics moves us into the world of the sophists and of early Plato in its treatment of the themes of the goal of life, and of the relations between self-interest and morality and between *nomos* and *physis*. The atomism of Leucippus and Democritus exercised a continuing influence throughout subsequent centuries, whether as a challenge to be faced, most notably by Aristotle, or as a forerunner to Epicureanism in all its aspects, and thereby to the revival of atomistic physics in the Corpuscular Philosophy of the sixteenth and seventeenth centuries.

APPENDIX

I conclude with a brief discussion of the vexed question of the connections (or lack of them) between Democritus' ethics and his physical theory. In an earlier discussion (Taylor [423], endorsed without further argument in Gosling and Taylor [414]) I argued against Vlastos' claim (Vlastos [424]) to find significant connections between the content of the two areas of Democritus' thought. Vlastos' position has found some recent defenders (and my views some critics), notably Sassi [421] and Farrar [96]; these discussions seem to me to call for some reexamination of the question.

It is, I take it, common ground that in composing his ethical writings Democritus had not abandoned his physical theory, and therefore that, at the very least, he would have sought to include nothing in the former that was inconsistent with the latter. I shall make the stronger assumption that he took for granted in the ethical writings the atomistic view of the soul as a physical substance pervading the body. However, I remain unconvinced of any closer connection between physics and ethics. In particular, I see no indication that any ethical conclusions (e.g., that the good is "cheerfulness") were supposed to be derived from the physical theory, or that the physical theory provided any characterisations of the nature of any ethically significant psychological state. In other words, I see no evidence that Democritus believed in type-type identities between ethical states such as cheerfulness and physical states such as having one's soul-atoms in "dynamic equilibrium" (Vlastos [424] 584, Farrar [96] 229). My earlier criticisms of this kind of view still stand.

There is, however, one particular point on which I now think that I took scepticism too far. This was in my rejection of Vlastos' interpretation of B33, that teaching creates a new nature by altering the configuration of the soul-atoms. My reason was that *rythmos* was an atomistic technical term for the shape of an individual atom, not for the configuration of an atomic aggregate, for which their term was *diathigê*. Hence *metarythmizei* (or *metarysmoi*) in the fragment could not mean "reshape" in the sense of "produce a new configuration." But, as Vlastos had already pointed out, the catalogue of Democritean titles includes *Peri ameipsirysmiôn, On changes of shape* (D.L. IX.47), which cannot refer to changes in the shapes of individual atoms (since they are unchangeable in respect of shape), and must therefore refer to changes in the shape of atomic aggregates. Further, Hesychius glosses *ameipsirysmein* as "change the constitution (*synkrisin*) or be transformed," and though he does not attribute the word to any author it is at least likely to have been used in that sense by Democritus, since neither the verb nor its cognates are attested to anyone else. It therefore now seems to me that Vlastos' reading of the fragment is probably correct. For Democritus, teaching, like thought and perception is a physical process involving the impact of *eidôla* on the soul, with consequent rearrangement of the soul-aggregate. (Cf. B197: "The unwise are shaped (*rysmountai*) by the gifts of fortune ...," and n.14) Acceptance of that causal picture does not, of course, commit one to endorsing type-type psychological identities.

Psycho-physical identity having been set aside, some looser connections between Democritus' ethics and other areas of his thought may perhaps be discerned. In Taylor [423] I argued for a structural parallel between ethics and epistemology, a suggestion that still seems plausible to me. Another vague connection is with cosmology. It is not unreasonable to suppose that Democritus saw at least an analogy between the formation of worlds (*kosmoi*) from the primitive atomic chaos by the aggregation of atoms under the force of necessity and the formation of communities (also termed *kosmoi*, B258, 259) by individuals driven by necessity to combine in order to survive. It may also be (as suggested by, for example, Müller [496]) that the aggregation of like individuals to like, which is attested as operating in the formation of worlds (DK 67 A1.31), had some counterpart in the social sphere.

NOTES

A version of this chapter has already appeared as part of the chapter "Anaxagoras and the Atomists" in C. C. W. Taylor, ed. *Routledge History of Philosophy*, Vol. I, *From the Beginning to Plato* (London, 1997), and material from it also appears in *The Atomists*, text and translation by

C. C. W. Taylor (Toronto, 1999). Permission from these publishers to reprint Mr Taylor's work is gratefully acknowledged.

1 For Democritus' poetics, which falls outside the scope of this chapter, see Most in this volume p. 339.

2 To adapt Aristotle's example (*Metaph.* I.4 985b18-19), AN differs from NA in ordering, and AN from AZ in orientation within a given ordering.

3 While most of the ancient sources agree that atoms are too small to be perceptible, some late sources indicate that some atoms are very large (even on one account "as big as a world"). It seems to me most likely that the atomists held that, while there are atoms of all possible sizes (for the same reason that there are atoms of all possible shapes), all the atoms in our world are too small to be perceived. See Barnes [14] ch. 17 (b).

4 For a full discussion of the atomists' use of this principle, see S. Makin, *Indifference Arguments* (Oxford and Cambridge, MA, 1993).

5 Plutarch states this maxim in what is presumably the atomists' own terminology: "The thing no more is than the no-thing," where "thing" represents the word *den*, an artificial formation specifically coined to contrast with *mêden*, "nothing," itself etymologically equivalent to *mêd' hen* "not one [sc. thing]."

6 For a fuller discussion, see Sedley [409].

7 On the nature of these, see p. 187.

8 In Aristotle's system natural motion is motion that is intrinsic to the nature of a thing of a certain kind, for example, it is natural for a stone to move downwards, that is, to fall to the earth when unsupported. Things may also be caused, by the exercise of external force, to move in ways contrary to their natural motion, for example, a stone may be thrown upwards. The atomists' thesis that all atomic motion is the product of precedent atomic interaction, is thus in Aristotle's terms equivalent to the thesis that all atomic motion is unnatural, a claim that he held to be incoherent (since the concept of unnatural motion presupposes that of natural motion).

9 See Kline and Matheson [403] and Godfrey [404]. I. M. Bodnár, "Atomic Independence and Indivisibility," *Oxford Studies in Ancient Philosophy* 16 (1998), 35–61, argues (at 49–53) that, rather than providing evidence for the actual views of the atomists, the texts of Philoponus are mere guesses prompted by his interpretation of the Aristotelian texts on which he is commenting.

10 Restrictions of space preclude discussion of various questions about the nature of atoms that have been the subject of much scholarly dispute. The vexed question of whether atoms have weight is discussed by numerous writers, most fully by O'Brien [407], with cogent criticism by

Furley [408]. On the questions of whether, and in what sense, atoms may be said to have parts, see for example, Barnes [14] ch. 17 (c) and Furley [400] ch. 6 and [99], ch. 9.3-4. I discuss these matters in my forthcoming commentary on the atomists, to be published by Toronto U.P. in the *Phoenix* Presocratics Series.

11 On the absence of explicit evidence for the early Greek philosophers' reflection on causal explanation, see Vegetti in this volume, Chapter 13.

12 The best discussion of the fragment is Barnes [399], who, while finally opting for an agnostic stance, is more sympathetic to the view that Leucippus may have accepted universal teleology. The nonteleological interpretation that I propose is also maintained by McKirahan [10] 321–22.

13 On the atomists' theory a world order begins to form when some of the infinite mass of randomly jostling atoms form a circular eddy or swirl.

14 The Greek of the last clause is *epirysmiê hekastoisin hê doxis*. I translate *epirysmiê* as an adjective, qualifying *doxis* (opinion), having the sense of "flowing in," from the verb *epirreô*. That is the sense of the word (which is found only in this passage (quoted by Sextus *M.* VII.137)) attested in the fifth century A.D. lexicon of Hesychius. On the other hand, *rysmos* (an Ionic form of *rythmos*) was an atomistic technical term for "shape" (Aristotle, *Metaph.* I.4 985b15-16), and one of the titles preserved in Diogenes Laertius' list of the works of Democritus (IX.47) is *Peri ameipsirysmiôn On Changes of Shape*, where *ameipsirysmiê* is a noun. Further, though the noun *epirysmiê* is not itself found, the verb *epirrythmizein* does occur (very rarely) in the sense of "alter." Some scholars (including Guthrie [16] and Barnes [14]) therefore interpret the word here as a noun, a variant for *ameipsirysmiê*, giving the sense "opinion is a reshaping." (H. de Ley, "Δόξις ἐπιρυσμίη: A critical note on Democritus fr. 7," *Hermes* 97 (1969) 497–98 actually proposes emending Sextus' text to read *ameipsirysmiê*.) The point of the fragment is the same on either interpretation, namely, that our opinions about the world are determined by the impact of the flow of atoms from objects around us on our receptive mechanisms. That impact, produced by the constant influx of atoms, produces constant alteration (reshaping) of those mechanisms. The alternative interpretations pick out different stages in the causal process; since the whole process is required for an account of opinion and its relation to the reality of things, nothing substantial hinges on the choice of interpretation.

15 For instance, Barnes [14], ch. 24.

16 For a similar view see McKim [417].

17 See Taylor [423].

18 For further discussion of Democritus' psychology, see Laks in this volume, Chapter 12.

19 For details see my forthcoming commentary.

20 For a fuller discussion, see Kahn [416]. This valuable study identifies a number of areas, such as the conflict between reason and desire, in which Democritus' thought shows significant similarities to, and contrasts with, the early views of Plato.

21 While the relation between the concepts of conscience and of shame raises some intricate philosophical issues, I am not concerned to differentiate them, since the basic concept of self-reproach, which we find in the fragments, is common to the two.

22 See Antiphon DK 87 B44; Critias DK 88 B25; Glaucon's tale of Gyges' ring in Plato's *Republic*, 359b-360d; and Decleva Caizzi in this volume, Chapter 15. The text of Critias is translated in this volume p. 222.

23 For a fuller discussion, see Procopé [420], and for Democritean theology, see Broadie in this volume, p. 220.

SARAH BROADIE

10 Rational theology

I. INTRODUCTION

Ancient Greek philosophy arose in a culture whose world had always teemed with divinities. "Everything is full of gods," said Thales (Aristotle *De an.* I.5, 411a8), and the earliest "theories of everything" were mythological panoramas such as Hesiod's *Theogony*, in which the genealogy of the gods is also a story about the evolution of the universe. Hence when certain Greeks began to think about the physical world in a philosophical way, they were concerning themselves with matters which it was still quite natural to term "divine," even in the context of their new scientific approach. Because of this, it is not entirely obvious where one should draw the line between the theology of the early Greek philosophers and their other achievements. But clarity is not served by classifying as "theological" every statement or view of theirs that features concepts of divinity. To theologize is not simply to theorize using such concepts in a non-incidental way. Rather, it is, for instance, to reflect upon the divine nature, or to rest an argument or explanation on the idea of divinity as such, or to discuss the question of the existence of gods, and to speculate on the grounds or causes of theistic belief.

By these criteria, Hesiod's *Theogony* is not a work of theology. Nor, however, are the physical theories of Anaximander, Anaxagoras, and Diogenes of Apollonia, who all apply epithets signifying divinity to their fundamental principle.[1] Anaximander's Infinite, in Aristotle's words:

> ... does not have an *archê*, but this seems to be the *archê* of the rest and to contain all things and steer all things, as all declare who do not fashion other causes aside from the Infinite ... and this is divine.[2] For it is deathless and

indestructible, as Anaximander says and most of the natural philosophers (*Phys.* III 203b10-15[3]).

Diogenes of Apollonia, about a century and a half later, speaks in similar fashion of his own first principle, Intelligent Air (DK 64 B2-8). But in neither theory, it seems, is the divinity of the *archê* discussed or put to explanatory work. Anaximander's Infinite is not said to be the first principle on the ground that it is divine, but to be divine because it is the primary physical principle. Diogenes does not equate his principle with intelligence because this is implied by its being divine, but because the order of the cosmos can only be explained as the work of intelligence. Both theories are convertible into proofs for the existence of a divine being, but nothing could be further from their authors' minds than the need for any such proof. The question they ask is not "Does god exist?" or "What is god's nature?" but "What is the basic principle of the cosmos?" As members of a certain philosophical tradition, they assume that there is such a principle; as products of their culture, they call whatever is fundamental to the cosmos "divine." Much the same holds for the cosmic Mind which Anaxagoras postulated: "mixed with nothing, but all alone by itself" (DK 59 B12); not because it is divine – as if separateness befits divinity – but because only as separate can it perform its function of dividing things out. Anaxagoras is an interesting case, because there is reason to believe that nowhere in his book *On nature* does he actually speak of the cosmic Mind as "divine," even though he uses language ("such as knows all things," "controls all things," and so on), that traditionally implies divinity. It may be that even though, as a matter of course, he shares the general cultural attitude, he excludes the explicit term from his cosmology because he sees it as adding nothing to his theory.

Yet there can be no doubt that the identity at some level of description between divine reality and the subject matter of natural science shaped the course of early Greek philosophy in fundamental ways. This is true even when the level at which the identity holds lies below the horizon of the philosophers' quest for specifically *physical* explanation, as in the cases mentioned above. We cannot dismiss the identity as an alien feature of these philosophers' thoughts – dead weight from the past or a hollow form. This fails to account for the depth of solemnity with which they expound the nature of the basic principle – the deliberately crafted hymnic quality of their prose. And if Anaximander was carrying archaic lumber, this cannot explain how the identical burden could still be encumbering the late fifth-century Diogenes. We see the continuing of a tradition, but only because it was vigorously practised. A better theory is that the identity between gods and natural principles was never allowed to fade because it helped make sense of the philosophers' deep commitment to the enterprise of scientific inquiry: an enterprise by no means always appreciated in the wider circles of their culture.

The theistic framework affected not only the philosophers' language, but their thought as well. It is natural, in seeking for causes of physical phenomena, to assume at first that whatever we identify as a cause needs no explanation itself. But something, S, which in one context figures as cause of P, may on further inquiry turn out to have "a life of its own," that is, properties additional to those that shed light on P. Now such questions arise as, "What underlying nature explains the combination of all these properties in S?" and "Why does the combination give rise to P in some cases and not others?" What first appeared as an uncaused cause turns out to have causal roots itself. Acceptance that there need be no ultimates of explanation is a modern attitude that owes its existence to the emancipation of science from religion. But where the forces of nature are themselves felt to be divine, any theory identifying these forces stands forth as an *ultimate* explanation. For presumably nothing can be divine that is reducible to terms beyond itself. It follows, so far as the early Greek philosophers are concerned, that (as we would put it) the difference between metaphysical and empirical investigation remains unrecognised. Diogenes' first principle, for example, is both what we breathe and something mysterious and sublime: part of nature and at the same time nature's ground.[4]

So far, we have mentioned philosophers whose work is not theological in the sense indicated in the first paragraph, although clearly it is of interest to the historian of theology. But it is not always easy to draw a line between philosophizing about god as such, and philosophizing about nature from a theistically charged perspective. Inquiry of the latter sort naturally generates questions for the former, and when the same philosopher engages in both (the prime example is Empedocles), the levels may combine in a single theory. The shift to theological reflection is inherently likely, since theistic religion naturally generates care about forms of expression. In the area of speech, reverence towards the god entails meticulous avoidance of possibly impious modes of utterance. This attitude was extended to the subject matter of natural philosophy. Thus when critical theology began, scientific theories about the divine were put forward as fruits of a search for *piously appropriate discourse* (and were usually accompanied by scathing denunciation of contrary views). It was this concern for pious speech that gave Xenophanes of Colophon a place in the history of Western philosophy, as the first to theologize against popular conceptions of the divine. His conception of god, though profound, lacks the theoretical richness of the conclusions reached by Heraclitus and, later, Empedocles, who were responding to pressures from philosophy itself, including that of Xenophanes. Empedocles is a complicated figure, since according to the account offered here, his theory of the universe grew out of a struggle to integrate what for him were the clear demands of piety with the distinct demands of cosmological explanation.

But Empedocles himself would not have recognised this as a description of his enterprise. He inherited an intellectual tradition in which truth about ultimate realities is a unique kind of truth precisely because, by its subject matter, it is truth about the divine. If the field of cosmology is, as such, a hallowed domain, cosmological methods as such must heed the demands of piety as well as (to us) the more strictly rational requirements of coherence and consistency. One consequence, apparent in Empedocles and in Parmenides before him (although cosmology is not Parmenides' primary concern), is a methodological dependence on divine assistance. The preambles introducing Empedocles' Muse and Parmenides' tutelary goddesses (DK 31 B3 and B131; DK 28 B1) deserve philosophical as well as literary attention. Both philosopher-poets hark back to Hesiod's invocation of the Muses in the *Theogony*: the singing daughters of Zeus, who himself is also audience and theme of their song. When singer and audience change, becoming Hesiod on one side and his human listeners on the other, the theme remains the same: but only because the Muses are now inspiring the singer, who must otherwise sink to a theme on his own plane. Piety entails the admission that only god unaided can fittingly celebrate god. And these Greek thinkers shared another intuition also familiar to us from the Bible: that piety requires hands and heart to be morally clean and pure.

In the ancient Greek context this gave rise to the curious doctrine, which had a long history ahead of it, that those who scale the intellectual heights must be ethical paragons too.

2. XENOPHANES

Xenophanes thought systematically about nature and about god, but how these topics of his were connected we can only guess. His interest in the physical world is of a distinctly empirical cast. He speculates about the fundamental materials of things – water and earth, according to him (DK 21 B29; B33) – and he explains a wide range of phenomena in terms of clouds, which come from water.[5] Yet it seems that he never in solemn metaphysical style spoke of the basic substances as all-encompassing or running through all (cf. Empedocles, DK 31 B17.32-34). Such relation as there was between his science and his theology may have consisted in the assumption that if, as Milesian philosophy was currently demonstrating, the use of reason can illuminate the workings of nature, then it can also bring better conclusions about the separate topic of the gods. Better, that is, than the views that simply lay to hand: popular notions stamped into the culture by cultic practices and by poetry and works of art. Science, moreover, could serve the cause of rational theology by providing naturalistic explanations of, for example, eclipses (generally regarded as portents) and St. Elmo's fire and the rainbow (generally regarded as divine visitations; cf. DK 21 A35, A39, B32).

Writing in verse in the genre known later as *sillos*, a vehicle for caustically humorous moralizing, Xenophanes declared:

If oxen and horses and lions had hands
and were able to draw with their hands and do the same things as men,
horses would draw the shapes of gods to look like horses
and oxen to look like oxen, and each would make the
gods' bodies have the same shape as they themselves had (B15).

He also couched the point in terms of different races of men: the Ethopians' gods are flat-nosed and dark, those of the Thracians red-haired and blue-eyed (B16; cf. B14).

But the anthropomorphic error strikes deeper, and instead of being merely ridiculous becomes morally corrupting and impious. Long before Plato was preaching the same lesson (*Rep.* II 377d ff.), Xenophanes condemned the storytelling of Homer and Hesiod, who:

have ascribed to the gods all deeds
which among men are a reproach and a disgrace:
thieving, adultery, and deceiving one another (B11).[6]

And in a sympotic poem, he denounces symposiasts who, after the customary libation to the gods, recount "fictions of the men of old" about the battles of savage divinities (B1). As for Xenophanes' own conception:

God is one, greatest among gods and men.[7]
not at all like mortals in body or thought... (B23)
All of him sees, all of him thinks, all of him hears... (B24)
But without effort he shakes all things by the thought of his mind (B25).

Xenophanes also declared it no less impious to say that the immortal gods are born than that they die (Aristotle, *Rhet.* II.23 1399b6-9). And he said:

He always remains in the same state, moving not at all,
nor is it fitting that he go first here, then there (B26; tr. McKirahan [10]
with modifications).

A precise monotheism is not among Xenophanes' innovations, although the doctrine has often been foisted upon him. As his language shows, the issue for him is not the numerical unicity of the divine, but its self-harmony. Whether we say god or gods (and Xenophanes says both), what matters is that the divine cannot conflict with the divine; be forced into subjection, even by the divine (cf. ps.-Aristotle, *MXG* 977a31); or be divisible into different cognitive functions that might give dissenting reports. However, Xenophanes takes a new step in stating that piety requires us not to think of gods as coming to be. This sets a standard of theological rigour unmatched even by Plato, who in the *Timaeus* (34b) speaks of the created universe as "a blessed god." Attributing awareness to the deity would have been another striking innovation if, as seems not to be the case, Xenophanes had claimed this while theorizing about the *fundamental principle of nature.* The idea that mind is the best candidate for that theoretical role would have placed him ahead of the natural philosophers of his time. But it seems more likely that Xenophanes is invoking a prescientific notion of the "greatest *god*" as aware of all things. The thought itself goes back as far as Homer and Hesiod (*Od.* XX. 75; *Il.* VIII.51-2; *Works and Days* 267), although these poets could scarcely have conceived of Zeus as nothing but an all-controlling awareness, as perhaps Xenophanes does. Such a view would not, of course, commit Xenophanes to an incorporeal deity, and B23 ("not at all like mortals in body or thought") definitely implies the contrary. Nor, apparently, does Xenophanes find it awkward to hold that one and the same being (a) is corporeal, (b) "shakes all things," yet (c) is absolutely motionless (B25 with B26). In combining (b) and (c), he seems to approach the Aristotelian concept of the unmoved mover. For Xenophanes, though, the important point would surely be not that the divinity is motionless itself, but that it acts everywhere with effortless immediacy.

Xenophanes thought of himself as rendering great service to his fellows by the exercise of what he calls "our own [sc. kind of] wisdom [or: talent] (*sophiē*)," which he says contributes to prosperity and the rule of law. Victories in the Olympic games bring the *polis* no such benefits, yet Olympic victors are rewarded with civic honours, "not being as worthy of them as I; for *our* talent is better than the strength of men and horses" (B2, following Lesher). Whatever the range of Xenophanean *sophiē* – we have already seen samples – he compares it favourably to excellence of physique. Did Xenophanes note the correspondence between his and his god's most important characteristic, the mind? And if so, did he construct the conception of god in accordance with what he valued most about himself, or was it the other way round? It is difficult to believe the affinity plays no part in Xenophanes' proud claim to higher than Olympian honours. On the other hand, he also held that all things come from earth and return to it in the end (B27). The scope of "all things" is not clear: it cannot include god, but does it include the human mind? A passage making fun of the Pythagorean belief in the transmigration of souls (B7) suggests an affirmative answer. So does Aristotle's report that, when asked by the citizens of Elea whether they should sacrifice to a certain sea nymph or mourn her, Xenophanes replied that they should not mourn if they considered her a goddess, nor sacrifice if they considered her human (*Rhet.* II.23 1400b5). Let there be no blurring of the line between the race of worshippers and the race of those they worship.

This is the voice of traditional piety, which can also be heard in these lines:

No man has seen nor will anyone know
the truth about the gods and all the things I speak of ......
but [mere] belief is fashioned over all things [or: for all persons]
(B34).

Here Xenophanes answers any doubt we might have had about the singlemindedness of his rejection of anthropomorphism. The distinction between knowledge and mere belief, the human second best, bears out his description of the greatest god as not at all like us in body *or in thought*. Xenophanes' new account of the divine never purported to give out the truth about god as god would see it. One who could comprehend *that* would stand in no need of chiding *silloi*, which are meant specifically for beings whose ways are capable of improvement (cf. B18), including their ways of thinking about the divine.

But it would be a mistake to suggest "traditional piety" as the only determinant of Xenophanes' strict separation of the human from the divine. We must also take account of his decision (as it must have been) not to treat the greatest god as a principle of theoretical physics. Given his time, background, and interests, Xenophanes certainly knew the work of the Milesian philosophers, and it is plausible that their conception of the single physical *archē* helped inspire his of the greatest god. Xenophanes' aim, however, was not to expound a fundamental theory of physics, but, as a matter of moral and civic leadership, to wean his public from whatever was degrading and irrational in traditional notions of the gods. It would have defeated this purpose to set his discussions of god in the esoteric framework of a physical treatise. Thus it came about that Xenophanes' theology shows little trace of the pantheism implicit in Milesian philosophy and soon to be elaborated by Heraclitus.

3. HERACLITUS, PARMENIDES, EMPEDOCLES

Heraclitus

Heraclitus is an important figure in the history of early Greek theology, but since Chapter 5 of this book is devoted to him, our dealings here will be brief, and confined to comparison with Xenophanes.

Heraclitus inveighs against Hesiod, Pythagoras, Xenophanes, and Hecataeus, grouping them as "polymaths without insight" (DK 22 B40). The common factor may have been an interest in matters divine: the mythological approaches of Hesiod, versus the supposedly superior approaches of the three later figures. Pythagoras preached reincarnation and religious asceticism; Hecataeus' writings included a work on genealogy apparently composed in a demythologizing spirit; Xenophanes, we know. We may suppose that Heraclitus saw himself as theologizing, and as doing it better than these others. Whether he dismissed them collectively for failing to see the truth as he saw it, or levelled specific complaints against each, we can only guess, but either way, we can see fundamental points of contrast between Xenophanes and himself.

Xenophanes had declared it sacrilege to associate the gods with strife and deceitfulness. For Heraclitus, however, it is not the nature of god to be straightforwardly known (B93; cf. B32, B123). Xenophanes had spoken as if there *is* a plain truth about the gods, only mortals cannot rise to clear knowledge of it; for Heraclitus, that is because no truth is plain. According to Aristotle (*Eudemian ethics* VII.1 1235a25), Heraclitus reproached Homer for saying "Would that conflict might vanish from among gods and men!" on the grounds that there would be no attunement without contrariety. So from Heraclitus' perspective, Xenophanes is as blind as the Homer, whom he castigates; for Xenophanes and Homer take it for granted that strife is evil. And while Xenophanes had excluded movement and change from the divine nature, and held that god can neither cease nor begin, Heraclitus says:

> The god: day and night, winter and summer, war and peace, satiety and hunger. It alters, as when mingled with perfumes it gets named according to the pleasure [*hēdonē*, which also means "flavour"] of each (B67, tr. Kahn [232])

and:

> Immortal mortals, mortal immortals, living the death of the others and dying their life (B62).

There could hardly be a more aggressive denial of the conventional belief, unquestioned by Xenophanes, in the unbridgeable gulf between human and divine. And although Xenophanes would not have claimed to *know* god's values, he could hardly have sanctioned even a mere opinion that "To god all things are beautiful and good and just, but humans have supposed some unjust and others just" (B102).[8] No doubt Heraclitus thought that humans functioning humanly must, and should, insist on their human distinctions between the just and the unjust (cf. B33; B44). But on behalf of Xenophanes one might reply that *when* human beings apply those distinctions, that is, when they are operating in practical, not superhuman, mode, *then* it must be as if they have no inkling (as the Heraclitean philosopher thinks he has) of how things are to god. In other words, in the practical context, which is where Xenophanes pitches his messages, we are bound to carry on as if Xenophanes were right about the limits of human cognition.

Parmenides

In antiquity, the greatest god of Xenophanes came to be identified with Parmenidean Being. Xenophanes was portrayed as an Eleatic monist, Parmenides as a metaphysical theologian. The distortion of Xenophanes was worse than that of Parmenides, but distortion of Parmenides there was. Whoever accepts that spurious linkage of the two philosophers will naturally assume that Parmenidean Being is god. After all, the Way of Truth ascribes to Being many attributes of divinity: it is ungenerated, imperishable, immutable, whole, all-inclusive, and eternally present. Yet Parmenides himself, it seems, never calls his Being divine. If one accepts the identity with Xenophanes' god, one will conclude that Parmenides was silent on this one point because he took it for granted that Being is divine and expected his audience to do so too. We, however, are free to consider whether Parmenides might not have had reason for the silence. The solemnity of the Way of Truth, and the fact that the entire discourse is presented as divine revelation, make it unlikely to be accidental that Being itself is never described as god or godlike. The reason for this, presumably, is that Parmenides thereby signals that the Way of Truth is a very different enterprise from any that traditionally treated of divine things. In particular, the audience is not to mistake it for cosmology. Calling its topic "god" would have suggested that topic to be the origin or principle of the cosmos, in which case the account of it should respect the requirements of physical explanation. Instead, of course, Parmenides here launches the enterprise of pure metaphysics, with its own method of pure logic independent of physical assumptions. Only in the Way of Mortal Opinion does a deity explicitly figure in the subject matter:[9] a cosmic deity, as befits the cosmological Way of Opinion (DK 28 B12.3).

But what of the unnamed goddess, the source of revelation of both the Ways (B1.22ff.; B8.50 ff.)? Parmenides depends on divine illumination in broaching the untraditional material of the Way of Truth (and in demoting the cosmological Way to the level of Mortal Opinion). Is it that he appeals to divine authority because the Way of Truth's self-evident logic seems insufficient guarantee of its veracity? This would be a strange position. There is no sign that Parmenides has placed himself in a state of Cartesian doubt extending to the eternal truths. And from such a state to take refuge in divine authority without mustering (as Descartes tried to do) reasons to believe that god exists, would be naive to the point of absurdity. No, Parmenides' divinity signifies, rather, that one cannot seek truth by the Way of Truth, that is, by relying on reason alone, without having first placed oneself in the hands of the gods. For the Way of Truth is "far from the beaten paths of humans" (B1.27). It is a truth that is simply not credible to mortals attached to the mortal point of view. So Parmenides must abandon his human outlook *before* he can reach the gateway where the hierophantic goddess receives him and from which she ushers him to the Way of Truth. He must be transported *to* the gateway, and through it, in a chariot guided by subsidiary divinities, the "daughters of the sun" (B1.8). For suppose instead that while still undistanced from ordinary beliefs he had stumbled, as one might, on the logically self-evident premises of the Way of Truth. And suppose he had then, under his own recognisance, started down the Way, step by logical step. He would have encountered its conclusions about reality: conclusions intolerable to mortal minds. He would then have had to reject something logically compelling: either a starting point or a step. Alternatively, he would have stayed bound by these cogencies, while a different sort of compulsion, the force of "habit, born from much experience" (B7.3), would have caused him to reject the conclusion, thereby affirming in effect that the necessarily true entails the false or the meaningless. In any event, Parmenides would have brought reason into contempt and desecrated the "unshaken heart of well-rounded truth" (B1.29). The Way of Truth cannot be used to *refute* those who stand for common sense; for truth that is evident in its rational entirety to reason is not thus evident to those whom reason does not entirely control. So how are mortals to approach the level where mortal opinions have lost their power and rational insight holds sway? Not by means of their own rational insight! Hence the divine chariot-ride, in which the Parmenides-figure, most un-Olympically, appears as wholly passive (see especially B1.4: "Along the road I was being borne, along it wise mares were bearing me," after McKirahan [10]).

Empedocles

The amazing theories of Empedocles are rich in material for the history of theology. The present reconstruction will focus on the interplay of cosmogonic and transcendent aspects of divinity in Empedocles' philosophy of nature.[10]

Each cosmic cycle of Empedocles' universe begins with the disruption of an original wholeness, the unity of the Sphere. Under the stress of Hate (or Strife), one of two primal forces, the four "roots" separate out so as to constitute the regions we know as earth, sea, air, and fiery aither. The roots are called by the names of gods (DK 31 B6); Love, the other primal force, is identified with the goddess Aphrodite (also known as Cypris; see, for example, B17.24; B22.5; B73). So Hate, too, is a divinity, for it is as fundamental as Love. Empedocles stresses that the four roots and the two forces are "equal and coeval" (B17.19-20, B17.27, for example). Next, Love sets going a multistage zoogonic process culminating in the emergence of viable creatures capable of reproducing in kind. Thus Love, when she first begins to act, does not seek directly to undo the separation effected by Hate. Instead, she *exploits* the distinct natures of the elements by creating from them, through mixture, an array of new beings, the living forms. So far, then, Love has manifested herself in two very different ways: in the production of innumerable compound beings within the cosmos, and, as a limiting case, in the precosmic unity of the Sphere. (The limiting case will recur, as Love in each world-cycle prevails more and more until finally all is merged again in the Sphere.)

Empedocles says of the Sphere: "No twin branches spring from its back, it has no feet, no nimble knees, no fertile parts... it was a sphere." He also calls it a "god," and describes it as, "held fast in the close obscurity of Harmonia, a rounded sphere rejoicing in its joyous [or: circular] solitude [or: rest]" (B29, B31, B27, tr. KRS). This last passage draws attention to a traditional divine attribute, one that we would not expect to meet in a purely cosmological context: the condition of blessedness. The Sphere's solitude (or motionlessness), and its consequent bliss, set it apart from the cosmogonic divinities, Love, Hate, and the roots. The Empedoclean cosmos is full of deity, but not of blessedness. It is true that cosmogonic Love is also called "joy" by mortals (B17.24), but nature is equally the domain of Hate. And the joy that mortal creatures experience in virtue of cosmogonic Love is only a limited delight. The isolated bliss of the Sphere signifies divine transcendence, a concept scarcely available to Empedocles except through some such imaginative symbolism. It is not simply that the Sphere is not part of the natural order. This much is obvious, given its cosmogonic function as *source* of the cosmos. But the Sphere's joy shows it to be more than that. For the joy is not in its role as source, but in the solitary perfection which had to be shattered for that role to be actually played: as came to pass at the allotted time when "mighty Hate sprang to its prerogatives" and "one by one all the limbs of the god began to quiver" (B30, B31, tr. KRS).

Aristotle complained that Empedocles failed to explain the disruption (*Metaph.* III.4 1000b12 ff.). From Aristotle's undividedly scientific point of view, the complaint is justified. Empedocles, however, must have known that he was courting a heavier charge of incoherence when he spoke of the quivering limbs of the armless, legless, Sphere. The problem is not simply that the Sphere-notion is too weak to explain how the cosmos arose (a weakness barely concealed by talk of an appointed time and the prerogatives of Hate). If the Sphere-notion fails from the point of view of rational cosmogony, this is due to a positive cause, namely Empedocles' sense that whatever is source of the cosmos is also divinely transcendent, together with the fact that he conceptualizes transcendence as self-sufficient blessedness. Thus the cosmos exists through a Fall. Here Empedocles' cosmology points in a direction which he follows out in mythical, personal, and religious detail in his poem called *Purifications.* That story of a daemon exiled from heaven for sin and condemned to a thirty thousand year cycle of reincarnation has its seed in mortal "intimations of immortality." Perhaps the (also) very scientific

Empedocles took our propensity for such intimations to be a natural fact about us, and not less indicative of something fundamental about our world than the facts of respiration, sensation, and reproduction – works of Love which he tried in detail to explain (e.g., B65, 67, 84, 100).

Several passages suggest a further hypothesis: that the Sphere's transcendent dimension is meant to safeguard divine holiness. In a preamble to the cosmology, Empedocles prays:

> But turn from my tongue, o gods, the madness of those men, and from hallowed lips let a pure stream flow. And I entreat you, virgin Muse, white-armed, of long memory, send of that which it is right and fitting for mortals to hear, driving the well-reined chariot from the place of reverence (B3, tr. Wright [358]).

Elsewhere too, probably also in the cosmological poem, he begs the muse to help him reveal a "good account about the blessed gods" (B131; cf. B132).[11] The intensity of this plea for religious sanity is not surprising if we consider the dual powers, Love and Hate. In fact they are Good and Evil. Utterly unlike Heraclitus' creative War, father and undisputed sovereign of all things (DK 22 B53), Empedocles' Hate is "cursed" (DK 31 B17.19), "evil" (B20.4); its products are "deeply dismal at their strife-birth because they were born in anger" (B22.9, tr. Barnes [5]). Yet this horrifying power is *divine.* Empedocles does not soften the problem by presenting Hate as a neutral force of separation. Presumably he could not accept the corollary: the neutralization of "blameless" Love (cf. B35.13). But in declaring Hate so fundamental to the cosmos that it always tears the Sphere apart in the end and destroys the triumph of Love, Empedocles treads the edge of blasphemy. He is saying that the very existence of the cosmos proves the everlasting presence, as a god among gods, of a being that is *accursed.* A "good account about the blessed gods" should be both truthful (B17.26) and pious, but how is a good account possible if gods are only cosmogonic principles, the evil coordinate with good? Empedocles' resolution, it seems, is to postulate a noncosmogonic dimension for the cosmogonic Sphere, and to shift to it the burden of divine holiness.

The description of the Sphere in B29 (quoted on p. 216) is echoed in another passage:

> For he is not furnished with a human head upon limbs, nor do two branches spring from his back, he has no feet, no nimble knees, no shaggy genitals, but he is mind alone, holy and beyond description, darting through the whole cosmos with swift thoughts (B134, tr. KRS).

This divinity, however, is not portrayed as spherical but as a mind, and as coexistent with the cosmos. Presumably, this being is other than the sphere from whose destruction the cosmos takes its rise. But the new god too is a perfect unity, only now in cognitive mode: a single grasp of the entire actuality of the cosmos. Like the Sphere's "joy in its solitude/rest," this divinity has no discernible cosmogonic function, since its relation to the cosmos is what was later to be called "theoretical": the cosmos already exists.[12]

Despite its mental nature, Empedocles may have ascribed to this being a physical basis realized through the action of Love. Human thinking he held to be an activity of the blood, the most perfectly blended compound (B105, B98; see p. 267). If the same is true of divine thinking, we have another example of Love's skill in exploiting the effects of Hate. For in addition to creating the living things, Love makes possible a divine intelligence whose activity presupposes Hate in two ways: its physical base is a perfect fusion of Hate-separated elements, and its object is the entire cosmos, which depends for its existence on Hate.

Whether based on physical reality or not, this intellectual divinity signifies a direction for approximation. Empedocles thinks of the human mind as having a nature that flourishes or fails depending on the thoughts which occupy it. Most people mistake their own narrow experience for the whole of life, and let their minds be taken over by numberless "miseries that burst in, blunting thought" (B2, tr. KRS; cf. B110). Not being properly at home in a human mind, these occupants later depart to the corners of the world where they belong, leaving empty lodgings. But themes such as those of Empedocles' poem *On nature*, "if you behold them in the right spirit with pure exercises of attention" (tr. this writer), will stay planted and burgeon with many new thoughts of the same kind (B110). To say, as this passage does, that thoughts about the cosmos as a whole are the proper denizens of the human mind, is as much as to say that the cosmos *itself* as a whole is the true complement of mind *qua* thinking (as distinct from the blood that thinks). Love operates biologically to forward this *rapprochement* between mind and cosmos by maintaining the balance of the thinking blood; but here, uniquely in the animal kingdom, Love also pursues its unifying end through the mind's deliberate choice to live the philosophical life. And a yet more complete, because more universal, example of the work of Love would be the life of a philosopher such as Empedocles, who opens the way of true philosophy to others. Such figures, he says "arise as gods mightiest in honours, superior even to "prophets, bards, physicians, and leaders of men" (B146). Elsewhere, Empedocles calls such figures "long-lived gods" (B21.12; B23.8); and in the *Purifications* he dares proclaim himself one of them:

> Friends, who live in the great city of the yellow Acragas [sc. river] ... I give you greetings. An immortal god, mortal no more, I go about honoured by all, as is fitting ... (B112, tr. KRS).

For Empedocles, this is not blasphemous raving but a conclusion supported by cosmological reasoning framed with regard for piety.

Empedocles' phrase "mortal no more" (which along with "long-lived gods" must have set Xenophanes spinning in his grave) echoes Heraclitus' "immortal mortals"; but the thought is very different. Heraclitus meant that the coming to be and passing away of mortal things contributes to the immortal life of the cosmos, whereas Empedocles' immortal*ized* philosopher stands over against the cosmos as knower to known. We can make sense of immortalized if we think of the divinity of Empedocles' philosopher, and the divinity of his cosmic roots and forces, as belonging to different categories. The roots and forces cannot perform the cosmogonic tasks that qualify them as divine without remaining in existence throughout a cosmic cycle, but the philosophical genius has no need of chronological immortality to achieve the quality of life that places him among the gods.

4. FIFTH-CENTURY ATOMISM, AND BEYOND

The emergence of the atomism of Leucippus and Democritus marks a crucial point in the development of theological thinking. As long as the fundamentals of the cosmos were conceived as agencies or powers acting out their own natures, as indefinite presences rather than circumscribed objects, it was not absurd, impersonal though they were, to hold them divine; nor, conversely, to think of the gods as physical principles. But these attitudes had no place in ancient atomism, a theory whose physical ultimates are (1) solid and localized particles eternally colliding to no purpose, so minute as to be of no individual significance; and (2) the void, otherwise known as "No thing" (DK 68 A37), which true to its name does nothing beyond supplying the condition for atomic movement. Although these entities are understood to be ingenerable, imperishable, and ultimate, it would be ridiculous to call the void "immortal," or to speak of individual atoms as gods. At last we have a truly naturalized natural world.

With regard to theology, this stark new picture creates a new set of alternatives for those who take it seriously. Either (i) there is no god; or (ii) god is beyond nature and stands in no relation to it; or (iii) god, so called, is a nonfundamental phenomenon within the world; or (iv) earlier tradition was right in holding the origins of nature to be divine, but wrong in failing to understand that nature itself is matter devoid of god; from which it follows that the divine principle's essence and activity must be entirely nonphysical. A position of this latter kind would be adopted by Plato in the *Timaeus*, where an extramundane intelligence constructs atomlike entities as primary constituents of the cosmos. The second alternative has been included here merely by virtue of its logical possibility: it was not a live option until a much later period. The third, which many would hardly distinguish from the atheism of the first, was the position taken by Democritus.

But before we turn to Democritean theology, such as it is, it should be observed that the four alternatives, hackneyed enough to the modern mind, must all have seemed strange and shocking even to the enlightened among Democritus' contemporaries, so deeply rooted in their culture was the mythopoeic attitude towards nature. So it is not surprising that natural philosophy, for a time at least, continued to be done in traditional style as for example by Diogenes of Apollonia, who applied the term "god" to his one substance, Intelligent Air. Diogenes may have known the work of Leucippus, but apparently he found no need to argue against it. At the time, the burden of proof lay with the atomists, and Democritus saw that it could not be discharged unless atomism was supplemented by a theory explaining human belief in the gods. Several such theories were about at the time, and Democritus retailed more than one, whether borrowed or his own inventions we do not know. He suggested that the "gods" are physical phenomena, huge images that appear to mankind and sometimes seem to speak (B166; A74). He suggested that belief in gods arose from early man's terror at eclipses, thunder, and the like (A75). He held that human and animal mind consists of fiery particles and seems to have inferred that what human beings call "god" is a large external conglomerate of these (perhaps they sense it not merely as bright or fiery, but as a vast fellow-mind) (A74).

In his ethical writings, Democritus spoke of the gods as givers of good, not evil, and said that they only love those who hate injustice (B175, B217). He may have meant to express pragmatic approval for these common beliefs, while at the same time sending messages of purely humanistic import to those in the know: as for instance that hatred of injustice is essential to true happiness. No doubt belief in external divinities is inevitable, even appropriate, for ignorant people whose response to thunder is to set about placating the Thunderer rather than speculate as to its cause. In the same way such belief may be necessary for the ethically stunted who hold back from wrongdoing only through fear of punishment, not because they see morality as the root of happiness.

This ethical point receives a new twist in a fragment from a contemporary drama, *Sisyphus*, variously attributed to Euripides and to Critias, an older cousin of Plato. Here god is said to be the brainchild of a human genius who crafted the fiction in order to curb his fellows' wickedness:

> ... when the laws prevented men from open deeds of violence, but they continued to commit them in secret, I believe that a man of shrewd and subtle mind invented for men the fear of the gods, so that there might be something to frighten the wicked even if they acted, spoke or thought in secret ... There is, he said, a spirit enjoying endless life, hearing and seeing with his mind, exceedingly wise and all-observing, bearer of a divine nature ... If you are silently plotting evil, it will not be hidden from the gods, so clever are they ... For a dwelling, he gave them the place whose mention would most powerfully strike the hearts of men ... the vault above, where he perceived the lightnings and the dread roars of thunder, and the starry face and form of heaven fair-wrought by the cunning craftsmanship of time ... So, I think, first of all did someone persuade men to believe that there exists a race of gods (DK 88 B25, tr. Guthrie [17]).

On the notion that religion is founded upon a "noble lie" (cf. *Rep.* III 414b ff.), one can almost hear Plato murmuring that the supposedly mortal soul of mankind's secret benefactor must itself have harboured more than a touch of divinity for him to invent a skyful of gods *ex nihilo*, and perpetrate that illusion worldwide from time immemorial. What is more, if there are no gods, the order of the heavens (not to speak of the plant and animal kingdoms) must be an accident. To Plato, this is incredible, as in fact it seems to be to the *Sisyphus* character, who cannot refrain from speaking of "heaven fair-wrought by the cunning craftsmanship of time," when his doctrine should be that infinite time merely allows for the eventual chance emergence of a system such as our heavens. To affirm this, though, is like affirming that the order of a well-governed human society "is there" by chance, rather than because men apply intelligence to the management of their affairs, as we see in the case of the legislator and the lofty coiner of noble lies.

Perhaps what the *Sisyphus* character really meant was not that god is a myth, if by "god" is meant the source of order in the universe, but that belief in a being both higher than ourselves *and morally mindful of us* is indeed belief in a fabrication. To which the Platonic answer would be that the order of nature testifies to an ordering intelligence that *values* order even in the smallest details. How could it be a matter of indifference to such a god whether human beings conduct their lives in a just and orderly manner? (Cf. *Philebus*, 28c-29a; *Laws* X 888a-903b.) Here we see Plato in his way, as the archaic Empedocles in his, responding to the theological problem posed by their culture: how to frame a conception of god as more than simply the origin of nature, where "more" means whatever more is required to make sense of that origin as object of worship for beings like us: ethical animals who, though parts of nature, know what it is to be driven to seek to understand themselves and the whole.[13]

NOTES

1 Anaximenes is probably another example; see Cicero, *On the nature of the gods* (I.10.26, and DK 13 B2) with the discussion of KRS [4], 158–61.

2 Aristotle may be paraphrasing here, not quoting. But the rest of his language leaves no doubt that Anaximander regarded the *archê* as divine, and there is no reason (such as there is in the case of Anaxagoras; see p. 206) to suppose that Anaximander avoided using the word.

3 Translations of Pre-Socratic material are from McKirahan [10] unless otherwise attributed. For further discussion of Anaximander, see Algra in this volume p. 53.

4 The potential for absurdity is wonderfully exploited in Aristophanes' *Clouds*.

5 See Lesher [189] 132–37, for a survey of the evidence, and Algra in this volume p. 60.

6 See Most in this volume p. 337.

7 Or: "One god is greatest among gods and men."

8 These are not, or not all, Heraclitus' words, and some scholars question whether they are even a paraphrase. But the thought in the first clause is clearly implied by B80, for example, which equates Conflict with Justice and says that all things come about in accordance with Conflict.

9 Although Justice (personified at DK 28 B1.14) = Necessity = Fate is mentioned in both Ways, she occurs as part of the framework rather than as a topic.

10 This account focuses on Empedocles' cosmology, with only a side glance at the *Purifications* (here assumed to be distinct from the poem *On nature*, although the question hardly affects the present conclusions). It also assumes the general correctness of the interpretation of the cosmology by Solmsen [361]. His most crucial finding from the present point of view is that there is a zoogony of Love, but not of Strife (Hate). For further discussion of Empedocles' religious thought, see Huffman in this volume p. 75, and for a different interpretation of Empedocles' cosmology, see Graham in this volume p. 161.

11 See Kahn [365] 429–30, n. 8, on the grounds for locating B131 in *On nature*.

12 On placing B134 in the cosmology, see Kahn loc. cit. It is true that the divinity of B134 could be the cosmogonic Sphere if its knowledge of the cosmos were a *plan* (better still: a *dream*, shattered by Hate); but "darting through" (*kataïssousa*) tends to suggest an actual object.

13 The writer thanks Charles Kahn, James Lesher, and Tony Long for helpful comments, although this chapter does not necessarily reflect their views.

J.H. LESHER

11 Early interest in knowledge

I. POETIC PESSIMISM AND PHILOSOPHICAL OPTIMISM

The Greek philosophers were not the first to reflect on the nature and limits of human knowledge; that distinction belongs to the poets of archaic Greece. In Book XVIII of the *Odyssey*, for example, the failure of Penelope's suitors to sense the disaster awaiting them prompts some famous remarks on the mental capacities of the species from the disguised Odysseus:

Nothing feebler does earth nurture than a human being,
Of all the things that breathe and move upon the earth.
For he thinks that he will never suffer evil in the time to come.
So long as the gods grant him excellence and his knees are quick;
But when again the blessed gods decree him sorrow,
This too he bears with an enduring heart,
For such is the mind (*noos*) of human beings upon the earth,
Like the day the father of gods and men brings to them. (130–37)

Here, as on other occasions in the Homeric poems,[1] the thoughts of mortals reflect only their present experiences; the events that lie ahead lie also beyond their powers of comprehension. Conversely, when the gods choose to endow an individual with superhuman powers of insight, his knowledge is distinguished by its vast range:

Calchas, the son of Thestor, far the best of diviners
Who knew the things that were, that were to be, and that had been before.
(*Il* I.60–70)

But far more typical of the species are those "foolish ones, thinkers of the day" – Achilles, Agamemnon, and the suitors – who can neither "think of what lies before and after" nor heed the wise counsel of those who can. The same theme runs through much of early Greek poetry: mortals "think what they meet with" and fail to grasp the larger scheme of things:

> Of such a sort, Glaucus, is the consciousness (*thymos*) of mortal man, whatever Zeus may bring him for the day, for he thinks such things as he meets with. (Archilochus, fr.70)
> There is no mind (*noos*) in men, but we live each day like grazing cattle, not knowing (*ouden eidotes*) how god shall end it. (Semonides, fr.1)[2]

In such circumstances, "human wisdom" consists in recognizing the limitations inherent in our mortal existence and "not aiming too high." As Epicharmus cautions: "Mortals must think mortal things, not immortal ones" (DK 23 B20).

Traces of this older "poetic pessimism" can be seen in the teachings of the earliest philosophers. Two ancient sources (Arius Didymus and Varro in DK 21 A24) report that Xenophanes held that "it is for god to know the truth, but for men to opine." In the same vein, Xenophanes' near contemporary Alcmaeon cautions that:

> The gods have certainty (*saphêneia*) concerning non-evident matters,
> but [it is given] to men to conjecture from signs (*tekmairesthai*). (DK 24 B1)[3]

Heraclitus (DK 22 B104), Parmenides (DK 28 B6.4-7), and Empedocles (DK 31 B2.1-8) all issue the standard indictment of the *noos* of ordinary mortals.

In a number of other respects, however, the teachings and activities of the early Greek philosophers reflect a distinctly more optimistic outlook. According to Aristotle, Thales was the first of a series of investigators who sought to account for all natural phenomena by reference to a basic material substance or principle (*Metaph.* I.3 983b20). If we accept Aristotle's account as even approximately correct, we must think that Thales – and his successors Anaximander and Anaximenes – assumed that the basic causes and principles of nature lay open to human discovery. Since the accounts put forward by the Milesians show evidence of successive refinement, their inquiries have also been thought to represent the beginning of a "tradition of critical rationality" in the West.[4] Thus, although we have no express remarks on the topic of knowledge from any of the first philosopher-scientists, it seems entirely reasonable to attribute to them some degree of "epistemological optimism."

Several early thinkers also display an interest in the method or methods by which knowledge might be acquired, either by themselves or by others. The Ionian philosophers generally were remembered by later writers as specialists in "that part of wisdom they call *inquiry* concering nature" (*tautês tês sophias hên dê kalousi peri physeôs historian*).[5] In DK 21 B 18, Xenophanes appears to give his support for inquiry or "seeking" as opposed to relying on divine "disclosures" or "intimations":

> Indeed not from the beginning did gods intimate all things to mortals,
> But at length, as they seek (*zêtountes*), they discover better.

In the *Philebus*, Plato refers to a method of inquiry "through which every discovery ever made in the sphere of the arts and sciences has been brought to light," crediting the discovery of this method to a "Prometheus or one like him":

> All things, so it ran, that are ever said to be consist of a one and many, and have in their nature a conjunction of limit and unlimited. This being the ordering of things we ought, they said, whatever it be that we are dealing with, to assume a single form... then we must go from one form to look for two, if the case admits of there being two, otherwise for three or some other number of forms. (16c)

Some of the doctrines attributed to Pythagoras and his followers reflect the method Plato appears to have in mind here: that is, understanding the nature of an entity by enumerating its component elements.[6] At some point in the latter half of the fifth century B.C., the Pythagorean thinker Philolaus presents several accounts of natural phenomena along just these lines, identifying "Limiters" and "Unlimiteds" as the two component elements of "nature in the universe as a whole and everything in it" (B1 and 2), and affirming that nothing can be known without number (B4). The goddess who appears in Parmenides' poem will also promote "inquiry," though of a different sort, when she urges her student to steer his thoughts away from the path of familiar experience and to focus instead on her *elenchos* – her "testing" or "critical review" – of the possible ways of thinking about "what is." On these occasions at least, the philosophers undertook not only to convince their audiences of the truth of their novel doctrines but also to describe a process through which the truth could be discovered by anyone.

Finally, virtually every early thinker about whom we have any significant amount of information embraced what might be called the basic presupposition of epistemological optimism: that the events taking place in nature happen in accordance with a set of fixed – and therefore discoverable – general principles. The idea of a regulated process of change may have been only implicit in Thales' view of water as the substance from which all other things come into being and to which they return. However, when Anaximander states that things "happen according to necessity, for they [presumably the opposites] pay penalty to each other for their injustice according to the assessment of Time" (DK 12 A9), we have a clear expression of the view that nature is subject to its own internal principles of order.[7] Anaximenes' twin forces of condensation and rarefaction, Heraclitus' Justice, Parmenides' Justice and Necessity, Empedocles' Love and Strife, Philolaus' harmonizing power, Anaxagoras' ordering cosmic mind, and Democritus' Necessity all represent variations on an original Milesian theme: nature operates in a regular, and therefore understandable, manner.

Four early thinkers in particular – Xenophanes, Heraclitus, Parmenides, and Empedocles – explored the conditions under which knowledge – especially in the form of a broad understanding of the nature of things – can be achieved by human beings. These reflections do not exhaust early Greek interest in epistemological questions,[8] but they do feature many ideas that figure prominently in later accounts of knowledge.

II. XENOPHANES

As has been noted, Xenophanes' remarks about knowledge are best read in the light of his interest in religious matters: the powers of the human mind, like other human capacities and achievements, must be placed in comparison with the extraordinary cognitive powers of a supreme deity.[9] In DK 21 B23, for example, we are told that:

One god is greatest among gods and men,
Not at all like mortals in body or in thought.

The sense of the phrase "not at all like mortals ... in thought" emerges from the description of a divine being able to grasp things as a whole (i.e., without the individual organs of sense perception) and to "shake all things" through the power of his thought alone:

... whole he sees, whole he thinks, and whole he hears ... (B24)
... always he abides in the same place, not moving at all,
nor is it seemly for him to travel in different places at different times (B26)
... but completely without toil he shakes all things by the thought of his mind. (B25)

In B34, Xenophanes appears to draw the appropriate conclusion for creatures lacking in cognitive capacities of this sort:

And indeed no man has been, nor will there be,
Who knows the clear and certain truth (*to saphes*)
About the gods and such things as I say concerning all things.
For even if one were to succeed the most (*ta malista*)
In speaking of what has been brought to pass (*tetelesmenon eipôn*)
Still he himself does not know (*ouk oide*); but opinion (*dokos*) is allotted to all.

Both the wording and full significance of this fragment remain matters of controversy.[10] According to many ancient writers (see A1.20, A25, 32, 33, and 35), Xenophanes was a pioneering if somewhat inconstant sceptic. While his theological pronouncements may have been disconcertingly dogmatic, in B34 he appears to be anticipating the sceptical conclusion that there is no criterion that when applied can convert mere conjecture into a clear and completely reliable truth. But doubts about this reading were expressed as early as Diogenes Laertius (A1.20), and most modern authorities reject it as anachronistic. Xenophanes' reference in line three to "the gods and ... all things" suggests that "all things" could not have meant "all possible subjects" (for if it did there would be no reason to proceed to mention the gods as well). Since here "all things" probably means "all the constituents of the natural realm" (cf. B27: "all things are from earth ..."), B34 should not be read as the expression of a universal scepticism.

The similarities between Xenophanes' conception of a supreme being as "one" and "unmoving" and Parmenides' view of "what is" as "eternal, continuous, motionless, and changeless" led some later writers to view Xenophanes as the founder of Eleatic philosophy. As such, he was also assumed to have embraced a distinctly rationalist conception of knowledge, that is, to have "denied the senses in favor of reason" (see the reports of Aristocles and Aetius in A49). Scholarly opinion remains divided on whether this Eleatic Xenophanes ever existed, but most suspect that the association of the two thinkers was based mainly on two loosely phrased remarks by Plato (*Soph.* 242d) and Aristotle (*Metaph.* I.5 986b21).

Many features of Xenophanes' poetry, along with some of the views attributed to him in the ancient reports, sit poorly with the picture of a philosopher who discounted the validity of all sense experience. In the symposiac poem in B1, for example, he offers us a detailed description of a banquet that was also a feast for the senses:

In the midst frankencense gives forth its sacred scent,
and there is cold water, sweet and pure.
Golden loaves lie near at hand and the noble table
is loaded down with cheese and rich honey.
An altar in the centre is covered all about with flowers
while song and festive spirit enfold the house.

In B28, Xenophanes mentions that, "The upper limit of the earth is seen (*horatai*) here at our feet...," while in B31 he describes the sun as, "... passing over the earth and spreading warmth over its surface...."

Other fragments and reports display Xenophanes' interest in phenomena in distant locations: the presence of water in underground caverns, month-long "eclipses" (the annual disappearance of the sun in northern latitudes?), mountains and volcanic eruptions in Sicily, the freak electrical phenomenon known as St. Elmo's fire, divergent conceptions of the gods from Thrace to Ethiopia, and differing social customs from Lydia to Egypt.

In one especially revealing couplet, Xenophanes contrasts the popular conception of Iris – the rainbow-messenger goddess of traditional Greek religion – with the meteorological phenomenon that is there "to behold":

And she whom they call Iris, this too is by nature a cloud,
Purple, red, and greenish-yellow to behold. (B32)

As in his demythologized descriptions of the sea (B30) and sun (B31), Xenophanes maintains here that the quintessential natural marvel, the rainbow, should be described and understood not in terms of its traditional name and attendant mythic significance, but rather as "a cloud, purple, red, and greenish-yellow to behold." In these fragments Xenophanes appears not only to have accepted the testimony of the senses as a legitimate source of knowledge but to have encouraged his audience to employ their powers of observation to learn more about the world around them.

The main point of Xenophanes' remarks in B34, I would argue, is that no human being has grasped or ever will grasp the truth about the greatest matters – the attributes of the gods and the powers that govern the natural realm. The rationale behind this claim does not appear to be given in our text, but two considerations seem especially relevant: (1) given the contrast that Xenophanes draws elsewhere between divine and mortal capacities, we can be sure that no mortal being has the capacity to possess a godlike synoptic view of "all things"; and (2) given the common association of *saphêneia* with obtaining direct access to events and states of affairs,[11] our inability to observe matters firsthand would preclude any possibility of our knowing the clear and certain truth (*to saphes*) about them. The hypothetical line of argument contained in lines three to five would reinforce this conclusion. No one (moreover) should be credited with such a synoptic view simply on the basis of having described, perhaps even successfully predicted, individual events as they take place.

In these teachings Xenophanes sought to establish an upper limit to the search for truth, cautioning his audience that the limitations inherent in our human nature would always prevent us from knowing the most important truths. Yet in B18 and B32, he appears to encourage inquiry into natural phenomena and to express his preference for "seeking" for one's self over a reliance on divine disclosures. We should, therefore, remember Xenophanes not as the founder of Eleatic philosophy but as both advocate and cautionary critic of Ionian science.

III. HERACLITUS

Diogenes Laertius does not tell us the title of the little book Heraclitus deposited in the temple of Artemis but, given the subject matter of many of the surviving fragments, "The Truth – and How To Know It" would have been an apposite choice. What truth did Heraclitus seek to impart, how did he believe it had to be discovered, and to what extent did his views on these topics represent a novel conception of the nature and sources of human knowledge?[12]

Clearly, one central element in his message was that "all things" are linked together in some important way: "It is wise for those listening not to me but to the *logos* to agree that all things are one" (DK 22 B50).

While *logos* here can be understood as Heraclitus' account or description of the world (i.e., "listening not to me, Heraclitus, but to the account I have to offer"), the fact that the *logos* is described in B2 as "common" suggests that it refers also to the "real nature" or "deep structure" of the things themselves (cf. the reference in B45 to the depth of the soul's *logos*).

It also seems clear that the unity of things consists, in some sense, in the relationship of tension, strife, or conflict that holds between opposing qualities or entities:

> What opposes unites, and the finest attunement stems from things bearing in opposite directions... (B8)
> One must realize that war is common and strife is justice, and all things come to be through strife and are so ordained. (B80)

The ways in which the opposites lend support to one another, or require one another, or over time pass over into one another, are tied to the workings of one specific substance – fire – which functions both as the source from which other things come into being as well as a regulating force that sets limits or measures on the processes of change:

> The totality of things is an exchange for fire, and fire an exchange for all things, in the same way in which goods are an exchange for gold and gold for goods. (B90)

> The ordered world (*kosmos*), the same for all, no god or man made, but it always was, is, and will be, an everliving fire, being kindled in measures and being extinguished in measures. (B30)

Two especially visible and powerful forms of fire, the sun and lightning, are given credit for directing and controlling all natural changes:

> And thunderbolt steers the totality of things. (B64)
> The sun . . . shares with the chief and primal god the job of setting bounds to . . . the changes and seasons that bring all things. (B100)

Thus Heraclitus' thesis, at least in part, is that the natural world should be seen as a *kosmos*, an orderly realm in which all natural changes are overseen and directed by a supremely powerful cosmic intelligence. This cosmic power, fire (perhaps, in more modern terms, energy), shows itself openly in lightning and the light from the sun, but it exists also in the hidden tension or conflict uniting all opposites (cf. B65: "And Heraclitus calls it [i.e., fire] 'need and satiety' ").

Not surprisingly, the Zeuslike power that sets the limits for all natural processes and transformations is said to be supremely wise: "One thing, the only wise thing, is willing and unwilling to be called by the name of Zeus" (B32). While wisdom (presumably in us) consists in understanding how it operates: "Wisdom is one thing: knowing the intelligence ⟨which steers⟩ all through all" (B41).[13]

And in so far as, ". . . the dry soul is a flash of light, wisest and best" (B118), we should recognize that our soul stands in some relationship with this cosmic power and should seek to align our thoughts and actions with it.

According to Heraclitus, so profound an insight into the nature of things could never be gained from the teachings of recognized authorities and experts – of either a poetic or a philosophical stripe:

> The learning of many things does not teach wisdom (*noos*); else it would have taught Hesiod and Pythagoras, and again Xenophanes and Hecataeus. (B40)

> The teacher of most is Hesiod – this is the one they feel sure knows the most, he who did not know day and night, that they are one. (B57)

> What wisdom (*noos*) or intelligence (*phrên*) do they have? They place their trust in the popular bards and take the throng for their teacher, not realizing the many are bad, and the good are few. (B104)

The reference (in B50) to "listening not to me but to the *logos*" suggests that we should take Heraclitus' stricture quite universally: no awareness worthy of the name "knowledge" is gained simply by accepting a claim on the authority of our teachers, not even when the teacher is Heraclitus.

The inclusion of Xenophanes and Hecataeus – early practitioners of fact-finding travel and observation – on the list of those who prove that "much learning does not teach wisdom" suggests that inquiry of the Ionian sort will never bring us to a proper understanding of the cosmos. Fragments B45, "One could never discover the limits of the soul by going, even if one were to traverse every road, so deep a *logos* does it have"; and B101, "I inquired into myself," also suggest that Heraclitus opted not to pursue "inquiry" in the form advocated and practised by his predecessors.[14]

Less clear, however, is the value or importance he assigned to information gained in sense perception. Fragment B55 – "The things of which there is seeing, hearing, learning, these I prefer" – has been seen as a testimonial to the value of sense experience (even though this reading is slightly compromised by the inclusion of the broader term "learning"). The point of the remark, on this reading, is that whatever else we will need to do in order to acquire knowledge of the *logos*, we must first seek out information about the nature of things through our sense faculties. Yet, strictly speaking, what is preferred in B55 are the "*things* of which" (*hosôn*) there is seeing, and so on, presumably the persons, places, and objects that populate the natural realm. Asserting a preference for these *things* (perhaps as opposed to trusting the opinions of recognized experts) is not precisely a testimonial to the value of sense experience itself.

In fact, several fragments comment on how little in the way of a reliable grasp of the nature of things is obtainable from the senses:

> Bad witnesses are eyes and ears of those having barbarian souls. (B10)
> Uncomprehending, even when they have heard, they are like deaf people. The saying 'absent while present' bears witness to them. (B34)
> Thinking is an instance of the sacred disease, and sight is deceptive. (B46)

While other fragments make it clear that the truth we are seeking to discover is not a perceptible feature of the world:

> An unapparent connection is stronger (or better) than the obvious one. (B54)
> Nature (*physis*) loves to hide. (B123)

Fragment B51 provides some guidance as to how to acquire the sought-for understanding:

> They do not understand how, while differing from itself, it is in agreement with itself. There is a back-stretched connection like that of a bow or lyre.

Grasping the nature of the "back-stretched connection" in the case of the bow and lyre would presumably involve coming to understand how each of their component parts (string and wooden frame or bow) contributes to the effective operation of the whole: the string must be pulled taut against the frame in order for either the bow or the lyre to do its job – if no antecedent tension, then no subsequent action. We must go through the same process of analysis if we are to discover the full significance of the larger reality; we must discover how each of the contrasting features of the natural world contributes to the effective operation of the whole. "Understanding how the opposites agree" will require gaining an appreciation of how the same phenomenon can have opposite qualities from different points of view (B4, 9, 13, 37, 82, and 83), or how it can have opposite qualities for the same observer in different respects (B12, 49a, 58–60, 91, and 103), or how opposites can represent the successive stages of a single process (B57, 88, and 126), or how they essentially depend on one other (B23 and 111).

The frequency with which Heraclitus combines opposing qualities in his own paradoxical remarks suggests that he crafted his personal *logos* to reflect the larger *logos*, the complex hidden nature of the cosmos at large. The references to "the voice of the Sybil" (B92) and to "the lord whose oracle is at Delphi" (B93) point in the same direction: only those who are able and willing to think intelligently about what they see and hear, who can analyze a complex whole into its component opposing aspects and then link them together within a single operation, can hope to interpret either Heraclitus' *logos* or the *logos* that is common to all things.

Through his striking observations on the *logos* and hidden *physis* of things, and how these must be discovered, Heraclitus shifted the focus of philosophical interest in knowledge, away from the conventional view of wisdom as embedded in the teachings of revered poets and self-proclaimed experts, away also from the superficial awareness of the features of the world available to us through sense perception, and toward a theoretical understanding of the cosmos that is available to us through reflection on its complex but hidden nature.[15]

IV. PARMENIDES

At some point in the early decades of the fifth century B.C., Parmenides composed a poem whose form and contents fundamentally altered the course of Greek philosophical thought. While there are enormous interpretive difficulties in virtually all of the surviving fragments of Parmenides' poem, at least three features can be identified that serve to set it apart from earlier philosophical discussions: (1) the high level of abstraction with which Parmenides discusses the nature of "what is" or "the existent" (*to eon*), (2) the orderly manner in which each possible way of thinking about "what is" is distinguished and evaluated, and (3) the degree of rigour with which Parmenides establishes each attribute of "what is."

Parmenides chose to preface the main account with a proem (DK 28 B1) whose features are of great importance for understanding the meaning of the account set out in succeeding fragments.[16] The goddess makes it clear in the proem that the youth's education will fall into two distinct parts. He will learn,

Both an unshaking heart of very persuasive truth
As well as mortal beliefs in which there is no true trust. (B1.29-30)

The closely related ideas of persuasion and trust will appear on several occasions within the main account: the "it is" way of thinking about "what is" is identified as "the path of persuasion" (B2.4), the "strength of trust" will not allow anything to come to be from "what is" (B8.12), coming-to-be and perishing are driven off by "true trust" (B8.27-28), and "here I end my trustworthy account about truth" (B8.50). The "unshaking heart" promised to the youth in B1 also corresponds with the unshaking character of "what is" as it will be revealed to be (B8.4). In addition, the realm reached by the youth is so far removed from any region of the known world that it even lies beyond the usual distinctions: There are the gates of the paths of Night and Day... And the aetherial gates themselves are filled with great doors" (B1.11, 13). Since Night and Day are subsequently identified as the basis for all distinctions drawn by mortals (B8.53-59, 9.1-4), this feature of the proem appears to anticipate Parmenides' account of "what is" as a single undifferentiated unity. In short, the "very persuasive truth" promised by the goddess at the outset can only be Parmenides' account of "what exists" as an eternal, indivisible, unmoving, and unchanging whole.

Nevertheless, two obvious features of the phenomenal world – light and darkness – also figure prominently in the proem. We hear about the Heliades or "Daughters of the Sun," who escort the youth in his journey, and of a journey from the House of Night into the light. These details have often been read as symbolic representations of the fact that the youth is about to undergo an illuminating intellectual experience – a transition from philosophical darkness into the light. Yet both the grammar and sense of the phrase "into the light" link it with the Daughters of the Sun who have just left the House of Night, rather than with the youth himself.

These early references to the light of the sun are naturally read as anticipations of the central role played by the sun in the cosmological account presented in B8.56, 9.1-3, 10.2-3, and 12.1-2.[17] When, for example, the goddess concludes her preparatory remarks she predicts:

Nevertheless you shall learn these as well, how the things thought to be
Had to certifiably be, all pervading all. (B1.31-32)

While in B9.3-4 we are told that the "all" must be understood in terms of the powers of light and night completely pervading one another:

All is full of light, and obscure night together.
Of both equally, since for neither is the case that nothing shares in them.

In short, a number of the proem's features suggest that the youth will learn the "very persuasive" account of "what is" as well as a sun-based account of the natural world "in which there is no true trust."[18]

Parmenides never explains in so many words precisely what knowledge consists in, or why existing mortal thinking fails to measure up to the high standards for knowledge, but several fragments provide helpful clues.

As we have seen, the discovery of the correct way of speaking (*legein*) and thinking (*noein*)[19] about "what is" is associated with the attainment of complete conviction or persuasion. Achieving this condition is tied to the various arguments presented in B8 that establish that "what is" cannot possibly come into being, be destroyed, admit of division, or undergo change or development, arguments that Parmenides speaks of as "very many signs" (*sêmata*):

> ... still single remains the account
> That it is; and on this route are very many signs
> That "what is" is ungenerated and imperishable;
> Whole, single-limbed, steadfast, and complete ... (B8.1-4)

By contrast, one can neither know "what is not" (*to mê eon*)nor make it known to others:

> The other (way) – that it is not and properly is not –
> That I make known to you (*phrazô*) is a path wholly beyond learning,
> For you cannot know (*ou gnoiês*) what is not, for that is impossible,
> Nor will you make it known (*phrasais*). (B2.5-8)

The rationale behind this claim, it would appear, stems from the impossibility of any parallel set of *sêmata* for "what is not." Since "what is not" can never be said to be in any respect whatsoever (cf. B7.1, "for never shall this prevail: that things that are not are"), it lacks any identifiable, teachable, or learnable features that might serve to define its nature and enable one to acquire and impart knowledge about it.[20] In addition, B7 holds that the youth must discover the truth about "what is" by resisting the testimony of eye and ear and tongue (i.e., speech), and base his thinking instead on the "much-contested testing" (*polyderin elenchon*) of the possible ways of thinking about "what is" presented by the goddess:

> But do you restrain your thought from this way of inquiry
> Nor let habit force you, along this way of much experience,
> To ply your unfocused eye and echoing ear

And tongue, but judge by discourse (*logôi*) the much-contested testing
Spoken by me. (B7.2-6)

While the *logos* on which the youth is directed to base his decision is probably the goddess' "discourse" – the series of arguments she will set out in B8 – rather than any "faculty of reason,"[21] becoming knowledgeable about "what is" is in any case a matter of resisting the pull of customary experience and reasoning one's way through the arguments against coming-into-being and destruction, divisibility, movement, and change or development that run the course of B8.

To sum up, the "it is" way of speaking and thinking about "what is" represents the knowledge promised to the youth by the goddess in so far as "it is" has been shown to be the one and only true, truly trustworthy, hence fully persuasive way of speaking and thinking about "what is." In some respects, this way of speaking about knowledge would not have struck those listening to Parmenides' words as a wholly peculiar idea: the same elements of a testing process, true speaking, identifying signs, and the attainment of complete conviction had already figured prominently in the most famous moments of discovery in all of Greek literature.[22] (It would be hard to imagine a better way of demonstrating that the youth has acquired knowledge about "what is" than by showing that his grasp of its nature possesses all the usual hallmarks of knowledge.) But when the goddess claims that he must acquire his knowledge of "what is" through a process of reasoning, making no use of the information provided him by his senses, she places a premium on rational argument and reflection that is both novel and extremely influential.[23]

Having now completed her account of how one should think about "what is," the goddess announces:

Here I end my trustworthy speech (*piston logon*) and thought
About truth. Henceforth learn mortal opinions (*doxas*),
Listening to the deceitful ordering (*kosmon apatêlon*) of my words.
(B8.50-52)

She proceeds immediately to explain that mortals have erred in distinguishing fire (or light) and dark night as entirely separate and independent opposites (B8.53-59). Scholarly opinion remains deeply divided on the significance of this phase of the goddess's instruction, the "*doxa* section." According to some accounts, the theory put forward in these fragments is not Parmenides' own but merely a composite of the views currently held by other philosophers. Other scholars believe that the *doxa* presents Parmenides' own views but only as a second-best explanation to the account he has just presented. An still others believe that Parmenides is supplying his students with a cosmological account he believes to be completely false, perhaps as a way of innoculating them against the appeal of all such ways of speaking, as is suggested by B8.60-61:

All this arrangement I proclaim to you as plausible;
So that no opinion of mortals shall ever overtake you.

But when the goddess characterizes "all this arrangement" as "plausible" (*eoikota*), she can hardly be referring to the erroneous conception of mortals just mentioned – for their view is hardly plausible at all (cf. B8.54: "that is where they have gone astray"). Her plausible arrangement can only be the combined light-night based cosmology that will be presented in B9-12, 14, and 15. Here, I think, it is difficult to suppose that Parmenides is not committed in some degree to the truth and knowability of the views he is putting forward. In B10, for example, the goddess describes the exercise in cosmological instruction in terms that unmistakeably connote *knowledge*:

And you shall know (*eisêi*) both the nature (*physin*) of the aither
And all the signs (*sêmata*) in the aether...
And you shall learn (*peusêi*) the wandering works of the round-eyed moon
As well as its nature (*physis*)... (B10.1-2, 4-5)

In addition, when she explains (in B9) that "all is full of light and night together... since for neither is it the case that nothing shares in them," she speaks as one fully cognizant of the lessons concerning "what is not" presented in B2-8. There is some reason, then, to view her account as a credible cosmology purged of the errors that have infected all previous mortal thinking, one fully consistent with the conception of "what is" set out in fragments B2 to B8.[24]

Clearly, there would be no implication of falsehood present in her characterization of the "arrangement" as *eoikota* (likely or probable). Forms of the expression are used by philosophers from Xenophanes to Plato to refer to an account that is being put forward as true even though it cannot be known with complete certainty.[25] And although "no true trust" has routinely been regarded as synonomous with "false,"[26] "lacking in true trust" at B1.30 contrasts only with "an account that yields an unshaking heart of very persuasive truth." Clearly, it is possible for an assertion to be regarded both as true and as less than "very persuasive." Not even the deceptiveness of the arrangement of the goddess' words (*kosmon emôn epeôn apatêlon*) should be taken as a declaration of their out-and-out falsehood (indeed, a patently false account of the cosmos would hardly deceive anyone).[27] Rather, "deceptive" here in B8 is the correlate of "no true trust" at B1.30; both signify that no account of the cosmos, not even the one Parmenides is now putting forward, can be trusted completely – as can the account of "what is" just presented, the account in which "true trust" drove off all coming into being and passing away (B8.28-30). We have some warrant, therefore, for regarding the distinction between the two phases of the goddess's instruction, with the attendant distinction between achieving "true trust" and mere "likelihood" or "plausibility," as an attempt to mark off two distinct forms of knowledge. Since the first of these is concerned with a set of propositions whose truth can be proven through the use of logical argument, while the second focuses on the nature of things we encounter through sense experience, Parmenides' account may be described in more modern terms as a pioneering attempt to distinguish a priori from empirical knowledge.

V. EMPEDOCLES

In the generation after Parmenides, Empedocles composed a poem[28] in which he invited his "much-remembering Muse" to "drive her well-reined chariot from the place of reverence" (DK 31 B3) and "stand by as a worthy *logos* of the blessed gods" (B131) was being unfolded. If these phrases had not yet identified Empedocles' effort as a direct reply to Parmenides, B17.26 would have removed all doubt: "But you listen to the venturing of an account that is not deceptive" (*logou stolon ouk apatêlon*). While Parmenides had denied the possibility of unshaking conviction with respect to the nature of things in the physical realm, Empedocles commands his disciple, Pausanias, to "know (*isthi*) these things clearly (*torôs* – 'piercingly'), having heard the story from a god" (B23.11). At the centre of Empedocles' philosophy is the view that the cosmos consists of four uncreated and indestructible elements (earth, air, fire, and water) together with two alternating forces (Love and Strife), with everything else that exists resulting from the combining or separating of these elements in varying proportions. Thus, while there may be no coming into being or destruction in any absolute sense (for much the same reasons that Parmenides presented), we can nevertheless understand how individual (composite) bodies can be created or destroyed, move about, or display qualitative change.

Empedocles also speaks in standard Parmenidean terms when he urges his student to:

Know (*gnôthi*) as the trustworthy items (*pistômata*) of our muse command,
By dividing up discourse (*logoio*) in your inward parts. (B4.2-3)

as well as to meditate "deep in his thought organs":

For if, pushing [my words/ideas] deep down in your crowded thinking organs,
You gaze on them in kindly fashion, with pure meditations,
Absolutely all these things will be with you throughout your life. (B110.1-3)

Which raises an obvious question: How could Empedocles have supposed that his account of a complex and changing physical cosmos would be able to supply Pausanias with a reliable understanding when Parmenides had denied the possibility of achieving a completely reliable account of such matters?

The answer, I think, lies in Parmenides' own assertion (in DK 28 B 16) that the *noos* of mortals varies in accordance with the mixture (*krasis*) or physical condition of their wandering "limbs" or sense organs (see p. 255). Since, on Empedocles' account, all bodies emit and receive "effluences" (*aporroiai*) to and from one another (cf. DK 31 B89 and 90), our physical constitution seems to be determined to a significant degree by the nature or natures of the things that exist all around us. So if Parmenides was right to link thought with our bodily conditions (and, as we have seen, both poets and philosophers alike had stated that mortals "think what they meet with"), then we can conclude with equal justice that our thought is determined by all the things that are "present" to us:

> . . .intelligence (*mêtis*) among men grows according to what is present. (B 106)
> Insofar as they have changed in their nature, so far changed thoughts are always present to them. (B108)[29]

And precisely because thought is shaped by circumstances, we must exercise good judgment with respect to the particular things we "meet with," including the messages others might wish to impart to us:

> For narrow devices are spread throughout their limbs,
> But many wretched things strike in, and blunt their meditations. . .(B2.1-2)
>
> From these [words/ideas] you will acquire many others, for these themselves
> Will grow to form the character, according to the nature (*physis*) of each.
> But if you reach out for different things,
> Such as the ten thousand wretched things which blunt men's meditations,
> Truly [these ideas] will abandon you quickly. . . (B110.4-8)

For Empedocles, then, excellence in thought – the degree to which individuals can gain "wealth in their thought organs" – depends on the extent to which their "mix of ideas" corresponds with the realities themselves (more precisely, with the particular "ratio" or *logos* of the mixture that defines a thing's specific nature).[30]

In addition, as Theophrastus puts it, Empedocles makes sense perception "a result of the like":

> By earth we see earth; by water, water;
> By aether, shining aether; but by fire, blazing fire;
> Love by love and strife by baneful strife. (B109)

Perhaps as a consequence of identity in material, there is a symmetry between the effluences themselves and the pores in the individual sense organ that receives them (which explains why one sense faculty is incapable of perceiving the qualities detected by the others).[31] Acuity in perception, like acuity in thought, is also accounted for in terms of correspondence between the mixtures in the things and those in the perceiver (Theophrastus, *Sens.* 11). In short, Empedocles provides an account of sense perception and thought that ties both processes to the rational structure (*logos*) and physical nature (*physis*) of the things themselves. When combined with the commonly held view that our thoughts are shaped by physical conditions, these considerations provided Empedocles with excellent reason to offer the prospect of a fully reliable knowledge of the natural world.

Three features in Empedocles' account of cognition have a special importance for later Greek thinking about knowledge. First, while many early thinkers appear to have assumed that "like knows like" in some sense, Empedocles states the principle in terms of an isomorphism between the knowing mind and its object, an idea that assumes major importance in the theories presented by Plato[32] and Aristotle.[33]

Second, for Empedocles as to some degree for Heraclitus and Parmenides before him, knowledge consists in the grasp of the nature (*physis*) and rational structure (*logos*) of a thing.[34] The concept of the *physis* of a thing had played a key role in the transition from the world of ancient common belief and imagination to philosophy and science.[35] When used in connection with individual phenomena, *physis* designated:

> ...that cluster of stable characteristics by which we can recognize that thing and can anticipate the limits within which it can act upon other things or be acted upon by them.[36]

And when used in connection with the cosmos as a whole, *physis* supplied the early Greek philosophers with a framework for thinking about the physical realm in its entirety, either as one primordial substance from which all existing things originally came into being, or as a basic element or set of elements that represented, at bottom, what all things really are.

The concept of the "nature," "essential nature," or "what it is" of a thing will play a fundamental role in classical accounts of knowledge. On a number of occasions in Plato's early dialogues Socrates will affirm as a general principle that we must first discover the essential nature of a thing – its *ti estin* or "what it is" – before we attempt to determine what other features it might possess.[37] Both Plato and Aristotle will characterize knowledge in the most basic sense of the term as a matter of grasping in thought a thing's essential nature or *ti estin*.[38] This emphasis on grasping a thing's nature also explains the frequency with which "giving a *logos* or account" enters into a number of proposed definitions of knowledge,[39] since being able to explain "what a thing is" is quite plausibly regarded as a necessary condition for being said to know what it is.

Thirdly, as is clear from his injunction to Pausanias in B3, Empedocles accepts the possibility of a fully trustworthy grasp of the truth from a variety of different sources:

But come, consider by every device, how each thing is clear
Neither holding any vision as having greater trust (*pistin*) than hearing,
Nor the echoes of hearing over the clarities of tongue,
Nor hold back trust (*pistin*) from any of the other limbs which offer
a passageway for thinking (*noêsai*)
But think (*noei*) each thing in the way it is clear. (B3.4-8)

In fact, each of the conceptions of knowledge embraced by earlier thinkers finds a place in his account: like the Ionian inquirers, Empedocles undertakes to know the causes and principles of the things whose existence we discover through sense perception; like Heraclitus, he regards knowledge as a matter of grasping in thought the *logos* and *physis* of things; and like Parmenides, he holds that through pure meditation and analysing the *logos* in our breast, we can acquire fully trustworthy indicators of the truth. In articulating the idea of a plurality of sources of knowledge, Empedocles also anticipates the highly pluralistic view of knowledge presented in Aristotle's *Metaphysics* I, *Posterior analytics* II.19, and *Nicomachean ethics* VI.

NOTES

1 Cf. *Iliad* I.343-44: "Nor does [Agamemnon] think of what lies before and after so the Achaeans might safely wage war beside their ships"; similarly *Il.* III.107-10; XVIII.250; *Od.* XX.350ff.; XXI.85; and XIV.452.

2 Cf. Theognis, 141–42; Solon, frs. 1, 13, 16; Pindar, *Olympian* VII.25-26; *Nemean* VI.6-7; VII.23-24; XI. 43-47.

3 The text is uncertain. DK reads *peri tôn aphaneôn, peri tôn thnêtôn saphêneian men theoi echonti, hôs de anthrôpois tekmairesthai*, but others omit the phrase *peri tôn thnêtôn* (concerning things mortal).

I follow LSJ in inserting *dedotai* (it is given). Heraclitus (DK 22 B78) and Philolaus (DK 44 B6a) also contrasted divine with human knowledge.

4 Cf. Burnet [20] 3; Guthrie [15] 29; Barnes [14] 5; Lloyd [111] 49; McKirahan [10] 73–75; Cohen, Curd, and Reeve [7] viii; among many others. See the balanced remarks by Algra in this volume p. 60.

5 Plato, *Phaedo* 96a7-8. For Anaximander and *historiê*, see Aelian, *Varia historia* III.17 and Diogenes Laertius II.1; for Xenophanes, see Hippolytus in DK 21 A33.

6 Among them: musical harmonies (as in Philolaus DK 44 B6a, A24), geometrical solids (cf. Aristotle, *Metaph.* XIV.3 1091a15), the powers in the soul (Philolaus, B13), or the cosmos as a whole (cf. Aristotle, *Metaph.* I.5 986a).

7 See further Cherniss [87] 10, Vlastos [186] 82 and G. Vlastos, *Plato's Universe* (Seattle, 1975).

8 See, for example, in this volume Huffman's account of Philolaus pp. 81–2 and Taylor's discussion of the epistemological issues raised by Protagoras and Democritus pp. 189–96. On the importance assigned to truthfulness by Homer and Hesiod, see Most in this volume p. 342.

9 See p. 226 and Broadie in this volume p. 211.

10 Diels-Kranz, following H. Fränkel (*Hermes* 60 (1925) 185ff.), opted for the *iden* of Sextus' text over the *geneto* in Plutarch. The latter reading, however, has been recently defended by Hussey [246] and brings a greater degree of unity to Xenophanes' comments. On this reading, Xenophanes is concerned throughout to deny the existence of any individual endowed with a special gift for knowledge of the deepest truths. The various interpretations of B34 are reviewed in Lesher [189].

11 Cf. Herodotus II.44 where *saphes* knowing goes hand in hand with direct observation, and the contrast between *saphêneia* and *tekmairesthai* in Alcmaeon DK 24 B1.

12 Scholars have given widely divergent answers to these questions. The present account focuses on Heraclitus' remarks about nature as a cosmos energized and governed by the force of fire/Zeus/strife/opposition. I say little about the classic view of Heraclitus as a proponent of the theory of constant change, primarily because I regard it as a distortion of Heraclitus' ideas introduced by Plato and Aristotle. For discussion of this issue, see Kirk [233].

13 Assuming, following Marcovich [234], that *gnômên* (intelligence) refers to an existing intelligent being rather than to an "opinion" or "judgment" in the person who knows.

14 This is a controversial claim. Many have read B35, "Men [who are 'lovers of wisdom'] must indeed be inquirers (*historas*) into many things," as a statement in support of inquiry. But: (1) as Marcovich noted ([234],

26), *historas* meant "acquainted with," "versed in," "knowing," and did not specifically designate the fact-finding travel and observation of the Ionian philosopher-scientists; (2) no fragment or ancient report suggests that Heraclitus himself ever conducted any "fact-finding inquiry"; and (3) since the *logos* is common to all things, it could be discovered at work in the most familiar settings.

15 It might be argued that a distinction between what appears to be the case and what is actually taking place must have been obvious to many early thinkers, but Heraclitus is still the first thinker we know of to draw a distinction between being familiar with the perceptible qualities of an object and understanding its true nature.

16 Virtually no aspect of Parmenides' poem is free of textual or interpretive controversies. The account presented here attempts to render the proem and *doxa* sections consistent with the doctrines presented in B2-8. A variety of approaches to Parmenides are presented and criticized in Tarán [276]; Mourelatos [309]; KRS; Gallop [272]; and Coxon [270].

17 According to Theophrastus (*Sens.* 1ff.) Parmenides also sought to account for sensation and thought in terms of a mixture of the (sun-related) hot and the cold. B16 affirms that "As is at any moment the mixture of the wandering limbs, so *noos* is present to men...." For a discussion, see Vlastos [321] and Laks in this volume p. 255.

18 This is especially true if (as proposed by Bicknell [484]), we assign B10 with its many references to the sun, moon, stars, and aether to the proem rather than to the main account.

19 It is sometimes suggested that *noos* and *noein* in Parmenides' poem should be understood as an intuitive form of awareness much closer to knowing, recognizing, or being acquainted with than to any process of discursive thought or thinking (Coxon [270] 174; Mourelatos [309] 68–70; along with many others). But in B2.2 Parmenides refers to the "routes of inquiry which are 'there for' (or 'available for') *noêsai*," and since one of the two ways – the "is not" way – is described as "beyond learning," it could never have been a way "available for *knowing*." Moreover, *noos* can err, as is clear from B6.4-6. Indeed, without some possibility of an erroneous *noos* or *noêsis*, it would be hard to understand why the goddess would bother to warn the youth at B7.2 to keep his *noêma* from the "is-not" path of inquiry. What I take to be the correct view is defended by Tarán [276] 80–81, and Barnes [14] 158–59.

20 See the extended discussion of this point in Mourelatos [309].

21 Guthrie [15] 419–24 argues that the first instance of *logos* with the unmistakable meaning of "reason" does not occur until a century after Parmenides.

22 The scenes in the *Odyssey* (XXIII.107ff. and XXIV.324ff.) in which

Odysseus is recognized, first byPenelope and later by Laertes; the various points of correspondence are discussed in Lesher [494].

23 Most notably in Plato (cf. *Phaedo* 66, *Rep.* VI 490 and VII 533–34).

24 For a broadly similar assessment of Parmenides' cosmology, see Graham in this volume p. 168, and for a different interpretation of it see Sedley p. 123.

25 Cf. Xenophanes B35: "Let these be accepted, certainly, as like (*eoikota*) the realities"; and Plato's use of the phrase *eikota mython* (likely story) at *Tim.* 29d, 49c and elsewhere.

26 By KRS, Barnes [14], and Long [304], among others.

27 *Apatêlos* is not "false" but "deceptive" or "deceitful." As Simplicius explains, "...he calls this account 'seeming' (*doxaston*) and 'deceptive' (*apatêlon*), meaning not that it is simply false (*pseudê haplôs*) but that the perceptible has fallen off from intelligible truth to what is apparent and seeming" (A34).

28 I regard *Peri physeôs* or *On nature* as distinct from the *Katharmoi* or *Purifications*. The two-poem view is defended by Wright [358] and Kingsley [105], among others. Osborne [364], Inwood [357], and McKirahan [10] argue, inconclusively so it seems to me, that both poems formed part of a single work.

29 As Theophrastus explained (*Sens.* 10, A86), Empedocles' identification of thought with blood (B105) can be understood in this connection: "That is why we think especially well with the blood, for in this all the elements are especially mixed."

30 For Empedocles' identification of the nature of a thing with the *logos* of the mixture of its elements, see Aristotle, *De an.* I.4 408a13-23 and *Metaph.* I.9 993a15-24 (A78).

31 Theophrastus, *Sens.* 1 (A86). For detailed discussions of Empedocles' accounts of thought and sense perception, see Verdenius [498], Long [366], and Wright [358].

32 See *Phaedo* 79d; *Tim.* 47b, 90a-e; *Rep.* VI 500c.

33 See *De an.* III.5 429a; *NE* VI.1 1139a.

34 Cf. *kata physin* in Heraclitus DK 22 B1.4-5, and *physis* in Parmenides DK 28 B10. Parmenides never asserts that "what is" (*to eon*) has a *physis* – almost certainly because, as B8.10 asserts, "what is" can never "grow" (*phyn*). But he clearly does think that "what is" has a fixed and definable nature (cf. B8.4: "whole, of a single kind, unwavering, and complete"). Empedocles evidently agrees with Parmenides when in DK 31 B8 he regards *physis* as merely a name given to things by men, but in B110 he describes the process of learning as forming "character, according to the *physis* in each."

35 Vlastos, *Plato's Universe* (see n. 7), 19.

36 Vlastos ibid.

37 Cf. Plato, *Gorg.* 501a; *Laches* 190d; *Charmides* 176b; *Prot.* 360–361; *Meno* 71b, 80d, and 100b-c; *Lysis* 223b7; *Hippias major* 304d8-e2; and *Rep.* I 354a-b.

38 Cf. Plato, *Symp.* 211c; *Rep.* VII 520c; *Tht.* 175e; *Crat.* 440a; for Aristotle, cf. *Metaph.* VII.1 1028a36-37: "we think we know each thing most fully when we know what it is (*ti estin*), for example, what man is, or what fire is, rather than when we know its quality, quantity, or its place."

39 Cf. Plato, *Meno* 98a; *Rep.* VI 510c; *Tht.* 201d ff.; Aristotle, *APo* II.8-10.

ANDRÉ LAKS

12 Soul, sensation, and thought

Soul, sensation, and thought: a separate chapter could be devoted to each of these items. But, beyond considerations of space, there is a rationale for broaching them together, for these three notions are in some sense correlated. It is on certain aspects of this correlation that I shall focus. The first part of this chapter concentrates on the soul, and its relationship to the two other terms. The second part specifically will be devoted to the relationship between thought and the senses. Since an important aspect of the latter question bears on epistemology, some overlap with J. Lesher's contribution to this volume (Chapter 11) is unavoidable. However, I have tried to draw attention to "physiological," rather than epistemological problems. As it turns out, this emphasis may not be too artificial because, as we shall see, there is a question as to whether the early Greek philosophers' interests in the relationship between thought and the senses was not primarily physiological rather than epistemological, in a sense of the term "physiological" that remains to be spelled out.

I. TOWARD THE SOUL

Aristotle, criticizing the Platonic tripartition of the soul (*psychê*) in the *Republic* but following up some indications of the *Timaeus*,[1] distinguished four psychic functions: nutritive, sensory, locomotive, and intellectual (*De an.* II.2 413a21 ff.). That the soul digests and even that it is the source of motion sounds strange to us, but we are familiar with the view that it perceives and thinks. These are still included in the Cartesian construal of the soul.[2] To early Greek philosophers on the other hand, such an idea was far from obvious. They could talk about cognitive faculties without any reference to the soul. Empedocles' physical poem is a remarkable example of this. Although it contains one of the most elaborate treatments of perceptual mechanisms and thought processes to be found in early Greek thought, Empedocles makes no reference to *psychê*. It may be that this term, in as much as it was felt to be linked to "breath" (i.e., "vivifying breath"),[3] was not especially suited to Empedocles' views. For in contrast to most authors, he referred the most accomplished form of intellectual life not to dryness but to a certain kind of moisture, namely blood (DK 31 B105).[4] But we also find the soul marginalized in Anaxagoras. While elevating the "intellect" (*nous*) to the status of highest principle, he clearly uses *psychê* in the traditional, Homeric sense of "life": B12, "all that has *psychê*" only means "all living things." This is also the case in the only occurrence of the word in Empedocles, which comes from the religious poem *Katharmoi* (*Purifications*): B138, in the context of ritual sacrifice, speaks of "drawing off life (*psychê*) with bronze."

This state of affairs is most likely to be the trace, at a certain degree of philosophical sophistication, of the original dissociation between the soul, conceived as a principle of life, and the whole range of functions that we are accustomed to call psychological, such as feelings, passions, and cognitive processes. Although the Homeric human being may possess more unity than B. Snell's celebrated theory allowed,[5] it still holds true that *psychê* was not for Homer the principle of this unity but more like one of its constitutive elements – albeit a vital one.

As the fifth century progresses, however, soul, sensation, and thought become more and more tightly associated. One can even say that the history of this triad, during this period, is the history of its constitution, which ultimately led to a unified theory of psychological life.[6]

This unification is the result of a complicated process, in which three main fields must have interacted. It seems to be obvious that the poetic tradition, especially lyric poetry, played an important role in this story. It is there, for the first time, that the soul appears as the main organ of emotional life.[7] In addition, religious movements certainly contributed a great deal to the conceptualization of a personal psychic entity. Soul/body dualism may be said to go back to Homer, since, if *psychê* is life, *sôma* is as such the corpse. But the meaning of the opposition changes with the spreading of beliefs in transmigration, whose importance in the sixth and fifth centuries is beyond doubt.[8] The assimilation, in Orphic circles, of the body to the soul's tomb turns Homeric values upside down. The soul, far from suffering absolute deprivation when it leaves the body, only then begins its true life. It is difficult to know whether *psychê* was used to refer to the immortal "self" in Pythagorean circles[9]; but significantly Empedocles avoided using the term in this sense not only in his physical poem but also in his *Purifications*, despite the strong Orphic and Pythagorean background of the work.[10] *Psychê*, in this poem, is no more than life, as we have seen; the self is referred to through the much more evocative word *daimôn* (literally divinity). Thus when Democritus identifies the soul with the dwelling-place of one's good or evil *daimôn* (DK 68 B171), he appears to be invoking a secularized version of the extraordinary spiritual promotion that was bestowed on the old "vital breath" in the wake of religious considerations and cults of salvation.

Philosophy certainly played a role also in this evolution, but one that is somewhat difficult to assess.[11] Aristotle tells us that Thales attributed a soul to the magnet, because it moves iron,[12] and Anaximenes probably identified the soul with his first principle, the air; he could thus claim that soul governs the universe, just as it governs us (DK 13 B2).[13] There are several indications that further developments of the concept of the soul were shaped by two demands that go in two potentially opposite directions. On the one hand, the task was to unify psychic functions; on the other hand, to differentiate them. If Philolaus B13 is genuine,[14] it reflects some kind of intermediate stage: soul, localized in the heart, is recognized as being the sensory organ, while intelligence is still kept apart and localized in the brain. But one generation later, in Diogenes of Apollonia and Democritus, integration has reached its final stage. Air, for Diogenes, and spherical atoms, for Democritus, are both the material that constitutes the soul, and the sensory and intellectual centre of cognition.[15] Theophrastus' careful wording in his presentation of Diogenes' doctrine (*Sens.* 39) suggests that this comprehensiveness was intended: "Diogenes," he writes, "links to air sensations *too*, as he does life and thought." Anaximenes had identified the *psychê*, in its Homeric sense of life, with air, and air was probably also responsible for what we call thought, since it governs Anaximenes' universe. It now turns out that air is also responsible for sensations. The next question would of course be how to differentiate between sensation and thought. Diogenes invokes the quality of the air (only dry and pure air can think), Democritus invokes localization (the brain thinks).[16] This kind of criterion did not convince Aristotle that the difference had been accounted for.

The soul's new status as the central organ of life, emotion, and cognitive processes alike, reshaped current views about the relationship between body and soul. Two texts are significant in this respect. The author of the medical treatise *On diet*, talking about dreams, emphasizes the autonomy of the soul in the very exercise of its bodily functions:

> When the body is awake, the soul is its servant, and is never her own mistress, but divides her attention among many things, assigning a part of it to each faculty of the body – to hearing, to sight, to touch, to walking, and to acts of the whole body... But when the body is at rest, the soul, being set in motion and awake, administers her own household, and of herself performs all the acts of the body. For the body when asleep has no perception; but the soul when awake has cognizance of all things – sees what is visible, hears what is audible, walks, touches, feels pain, ponders. (IV.86, Loeb tr.)

This physiological autonomy finds its moral counterpart in Democritus, who takes soul to be responsible for the state of the body:

> If the body takes the soul to court, accusing it of all the pain and suffering of a lifetime, and he [= Democritus] is judge of the case, he would gladly find the soul guilty for having ruined the body with neglect and dissolved it with drunkenness, for having debauched and distracted it with indulgence, just as the user of a tool or equipment in bad condition is held responsible for its reckless misuse. (DK 68 B159)[17]

Even if it is impossible to decide whether the last comparison belongs to the author of the quotation (Plutarch), or goes back to Democritus himself, it is obvious that we are pretty close here to Socratic doctrine, just as by the end of the fifth century, Plato's and Aristotle's comprehensive concept of the soul is to a great extent already available.

What role did Heraclitus play in this development? Occurrences of the term *psychê* are remarkably frequent in his fragments,[18] a fact that obviously reveals his keen interest in the soul. In some cases at least, the soul appears as an organ of control, as in B117 ("A man when he is drunk is led by an unfledged boy, stumbling and not knowing where he goes, for he has his soul moist"); or as the source of psychological life, on one reading at least (the text is disputed) of B85 ("it is hard to fight anger (*thymos*); for one buys it at the price of soul").

Caution is in order, however. As with a number of other phenomena, Heraclitus' emphasis seems to have been less on the soul's governing role than on its paradoxical identity. His *special* interest in the soul is best explained, I suggest, by the fact that *psychê* – our own *psychê* – has the single privilege, among the many phenomena that display the universal tension between opposites, to be able to *feel* it. According to B77, for the dry soul (life, that is), psychic pleasure consists in becoming moist, and thus experiencing its own death, since moisture is what destroys dryness ("for souls, it is either pleasure or death to become moist"). Be that as it may, Heraclitus' statements on the soul seem to *presuppose* that it exercises some kind of controlling function rather than contributes to establishing the view. In this regard, it may be significant that Heraclitus offers no physiological theory about cognitive mechanisms and other vital functions.[19] Yet the double process of differentiation and unification that the soul underwent during this period would hardly have occurred without the emergence of physiological theories. On this point, it is interesting to contrast Heraclitus with Diogenes. Diogenes' theory relies on the same opposition that Heraclitus uses between the dry and the moist. But for him this means giving an extremely detailed account of how dry air and vital fluids (blood in the first place) are responsible for the totality of physiological functions – not only the senses and thought but also nutrition, sleep, respiration, and digestion. Nothing of the kind is to be found in Heraclitus. This is probably the reason why Theophrastus' *De sensibus* (*On the senses*), which includes a detailed account of Diogenes' theory (43-45), has nothing whatever to say about Heraclitus.

The question about Heraclitus' role in the development of a unified psychology raises the issue of the *kind* of interest that early Greek philosophers had in the various psychological functions, whether cognitive or vital. This issue is crucial for the discussion of early views about thinking and the senses.

2. DISTINGUISHING THE SENSES AND THE MIND

In his treatise *On the soul* Aristotle claims that the Ancients (*hoi archaioi*) took sensation and thought to be identical (*De an.* III.3 427a21-22). A contextualized version of the same verdict appears in *Metaphysics* IV.5 1009b12-15: "Because they assumed that sensation was thinking, and that the former consisted in an alteration, they claim that sensory appearance is true of necessity." In the following sentence, Aristotle names Empedocles, Democritus, and "so to speak every other," before adducing evidence, either about the alleged premise or the conclusion, from Empedocles, Parmenides, Anaxagoras, and an anonymous body of thinkers who took a line from Homer as support for their view. This evidence is worth looking at.[20]

(a) "A saying of Anaxagoras to some of his friends is also related, that things would be for them such as they supposed them to be." Aristotle relies here on oral tradition, rather than on Anaxagoras' treatise. The apophthegm does not mention the senses, and the story is about "what appears *to* [*Anaxagoras'*] *friends*," which, of course, does not imply that Anaxagoras himself would take what appears to be true to be true actually – rather the other way round. All these features suggest that Aristotle did not find in Anaxagoras' writings anything to support the view he wishes to attribute to him.

(b) Similar caution is required in interpreting Parmenides and Empedocles. Parmenides B16 says:

For as is at any moment the composition of the much-wandering limbs,
so mind is present to human beings; for them in each and all,
that which thinks is the same thing, the substance of their limbs;
for that of which there is more is thought.[21]

The fragment does not speak of the senses, but, as Theophrastus remarked (*Sens.* 3), of cognition in general (*gnôsis*); it concerns the thoughts of mortals (*noos, noêma, phronein*), which are characterized by their instability. The lines, which must come from the second part of the poem, do not represent Parmenides' views about correct thinking, which, at the very least, is as important to somebody's views about what thinking is as to his views about everyday (erroneous) thinking. As far as Empedocles is concerned, we shall see that Aristotle may have had better reasons for foisting on him, rather than on Parmenides,[22] the view that sense perception and thinking are identical, even if the passages to which he refers, B106 and B108, basically describe how human thinking varies (one should stress that in B106 at least, this variation is positive, not negative):

> Insofar as they [= the elements] have changed in their nature, so far changed thoughts (*phronein*) present themselves to them. (DK 31 108)
> For man's cunning (*mêtis*) grows according to what is present. (B106)

Aristotle's complex strategy in *Metaphysics IV*, like so much in this book, has its roots in Plato's *Theaetetus* ("knowledge is sensation" is the first thesis to be examined in the dialogue). This cannot be analyzed here, but it should be fairly obvious that the historical value of his remarks cannot be read straight off the text. This is confirmed by Theophrastus' treatment of the same topic in his treatise *On the senses*. It is true that to a certain extent Theophrastus gives support to Aristotle's claims. However, he is conspicuously more careful than his master. For one thing, he does not attribute the identity thesis to "the Ancients" in general, but only to Parmenides and Empedocles. Moreover, his treatment of these two authors is more nuanced than Aristotle's. The nuance may be subtle indeed in Parmenides' case. In *Sens.* 4, the sentence: "For he (Parmenides) speaks about perceiving and thinking as if they were identical," following the quotation of B16, is introduced as a justification of the fact that Parmenides spoke about thinking in terms of its instability (rather than as something that does *not* vary, as must have been presupposed in the Peripatetic point of view); the sentence does not strictly speaking assert that Parmenides took intellectual cognition to be identical with sensation. His report on Empedocles is even more telling: "Thinking takes place in virtue of what is similar, ignorance in virtue of what is different, whereby he (Empedocles) implies that thinking is identical or very similar to sensation" (*Sens.* 10). First, thinking is opposed to ignoring, and hence refers to true thinking or knowledge, not to thinking in general or false thinking. Second, the reason given for assuming that knowledge and sensation are the same makes clear that what is identical is not sensation and knowledge themselves but rather the principle of their explanation. The idea is that sensation and thinking both take place in virtue of what is like (*to homoion*), and the absence thereof in virtue of what is different/contrary.[23] Third, Aristotle's "identical" is corrected by the addition of "or very similar," a formula that allows a certain amount of difference. Last but not least, Theophrastus also makes clear that Aristotle's statement is to be construed as an implication, not as a report.[24] Thus, although Theophrastus' phrasing reminds us of Aristotle's, the implications are different.

This is significant. As a matter of fact, not only does Theophrastus not indulge in generalisations, he is also quite eager, throughout his treatise, to draw attention to the presence of an explicit distinction between sensation and knowledge in the authors he talks about. Thus he typically devotes a special section to "thought," as in the cases of Empedocles (10), Diogenes of Apollonia (44), and Democritus (58). He praises Alcmaeon for having offered a criterion that makes it possible to distinguish animals that possess only sensation from human beings, who have both sensation and understanding (25). We also get a precious indication, albeit an indirect one, in the case of Clidemus, who claimed that among the senses, "only the ears do not distinguish by themselves, but transmit to the mind" (38). It seems obvious that Aristotle's most faithful disciple must have thought that Aristotle had, to say the least, overstated his case. By and large, Theophrastus' doxography shows that "the Ancients" did draw the kind of distinction that Aristotle previously denied them (see p. 255).

Fragments and testimonies from other sources confirm this. Philolaus B13 (see p. 252), Xenophanes B34, and several of Heraclitus' fragments (DK 28 B1, 17, 34, 56, 72) take intellectual cognition to possess distinctive characteristics. Democritus notoriously opposed two kinds of cognition (*gnômê*), one that consists of "sight, hearing, smell, taste and touch," and another one that is "separate from this" (DK 68 B11). In a famous passage employing personification, he had the senses defying the mind: "Wretched mind (*phrên*), do you take your assurances from us and then overthrow us? Our overthrow is your downfall" (B125).[25] Thus, there is a sense in which the distinction between sensation and thought was a matter of course. Indeed, one wonders how it could have been otherwise. After all, part of the philosophical programme of the early Greek philosophers was to go beyond the evidence of the senses. Aristotle himself was very aware, in other passages, that the distinction was fundamental to some of them at least, and first of all to Parmenides. For in the *Metaphysics*, he says that, besides admitting a single principle "according to reason," Parmenides acknowledged two principles "according to sensation" (I.5 986b27), and in *On coming to be and passing away*, clearly referring to the Eleatics, he writes that "some of the older philosophers ... were led to transcend sense perception, and to disregard it on the ground that one ought to follow reason" (I.8 325a13).[26]

Why Aristotle came to hold two such different views about Parmenides, and whether he would have been prepared to find a similar duality in other early thinkers, are questions beyond the scope of this chapter. Yet, assuming the existence of a distinction between sensation and thought, we must ask what it amounted to.

I have already stressed Theophrastus' interest in spotting the distinction in the works he read, but his indications about its nature are at best sketchy and, in some cases, no less misleading than Aristotle's universalizing view. This is more because of what he omits than because of what he does say.

Some functional differences are indicated. Alcmaeon uses a word for "understanding" (*syniêmi*) that suggests some kind of functional distinction between perceiving (which is shared by all animals) and intellectual insight, which is distinctively human (*Sens.* 25). In Empedocles the opposition is between the fragmented insight of sense perception and synthetic insight through thinking, which in some sense is synaesthetic.[27] Diogenes' case is interestingly ambiguous. Thinking is distinguished from sense perception, but first, the distinction is material rather than functional. Diogenes says that we think "thanks to dry pure air," when distribution of this air through the whole body is not prevented by various blocking factors (44). Moreover, Theophrastus' testimony strongly suggests that Diogenes thought of *nous* as being the ultimate organ of perception. For in order to prove that "internal air" was the perceiving organ, he adduced as evidence the fact that "often, when our *nous* is directed towards other objects (when we think of something else), we neither see nor perceive" (43). If I am right, Diogenes was extending Clidemus' scheme to sight as well as to hearing, if not to all the senses. (Xenophanes, in the wake of Homer, had already said that the divine *nous* sees and hears, DK 21 B24). If this is so, the distinction between perceiving and thinking in Diogenes threatens to evaporate, although in a way Diogenes might be considered as making a real advance, for he anticipates the distinction in Plato's *Theaetetus* between the sense organs *through* which we perceive and the centre of sensation which perceives (184c). The difference, of course, is that Diogenes does not hesitate to call this centre *nous*, whereas Plato calls it *psychê*, leaving room for *nous* as a separate faculty.

In some other cases, however, Theophrastus' testimony, or rather the lack thereof, is baffling. We have already noted that Theophrastus shares Aristotle's strategy of sticking to the second ("false") part of Parmenides' poem and omitting all mention of Parmenides' remarks on thinking and cognition in the first ("true") one. His procedure in dealing with Democritus is also strange, for the only sentence devoted to Democritus' explanation of thought, difficult though it is, shows that Theophrastus did not intend to give a functional account of what thinking is, as he probably could (and, if so, should) have done: "On the topic of thinking, he said no more than that it comes about when soul is balanced after movement;[28] but if someone gets over-heated or too cold, he says it changes" (58). Even more puzzling is his attitude to Anaxagoras. Anaxagoras, if anybody, is the philosopher who postulates the purity of the intellect (*nous*), and Theophrastus must have known about Anaxagoras' view that "from the weakness of our senses we cannot judge the truth" (DK 59 B21a).

Thus, for all its scruples and precision, Theophrastus' treatise does not give the impression of having dealt adequately with the difference between the senses and thought. One could argue that, since he was writing a work *On the senses*, the distinction between the senses and thought was somewhat incidental to his purpose. Still, given that he is looking for evidence concerning this distinction in early Greek thinkers, the picture that emerges looks strangely distorted. Is this *only* due to Theophrastus' shortcomings? Might it not also be the case that, although the distinction was vital to them, they did *not* indeed draw a clear line between the two – clear, that is, according to Peripatetic criteria, let alone according to our own?

At this point it seems appropriate to refer to what is known as "the developmentalist view" about cognitive theories and cognitive terminology in early Greek philosophy. There are, broadly speaking, two main components to this view:

(a) Knowledge, in Homer, is on the whole "perceptual," and ultimately intuitive.

(b) In spite of the growing importance of *nous* as a means of access to "truth," or of going beyond the appearances, the views of early

Greek philosophers about thinking (and knowledge) remained heavily indebted to, and so to speak, under the spell of the Homeric model of intuitive knowledge.

Although, or rather because, this view does not claim that knowledge is equivalent to perceiving but only that it is ultimately to be construed on the model of perceiving, it can be seen as the modern equivalent to the old Peripatetic claim about identity between perceiving and thinking in earlier philosophers. Is there more to it than to its ancient counterpart?

The developmentalist view has recently been submitted to careful criticism by J. Lesher.[29] According to Lesher, not only did early Greek philosophers not identify perceiving and thinking (the Aristotelian thesis), but they also did not even conceive of thinking on the model of perceiving (the developmentalist view). Rather, thinking was thought to be fundamentally *reflective*, a property not shared by sense percepion.

The best evidence for this latter view is provided by Parmenides B8, where the process of "thinking what is" amounts to a series of inferential steps that Lesher has pointedly compared to Penelope's recognition of Odysseus in Homer (see p. 239 in this volume). Identifying what is Odysseus, and recognizing him for who he is, are not questions of perceiving or quasi-perceiving, but of carefully testing signs and following the course of an argument.

Other texts quoted by Lesher (such as Heraclitus B93 and B101) are more difficult to deal with, but support for a nonintuitive conception of knowledge and thinking can probably be drawn, fairly generally, from the cosmic or universal function that intellectual entities play in early Greek though. Empedocles' "holy mind," which extends through the universe (DK 31 B134.4), Xenophanes', Anaxagoras', and Diogenes' "intellect," as well as Heraclitus' "reason" (*logos*), are more easily construed as deliberating, organizing, or structuring powers, than as intuitive capacities. But caution is also in order. One should be wary not to make a mistake symmetrical to Aristotle's, and to resist the temptation to generalize from a relatively small body of evidence. Even the most suggestive testimonies in favour of the reflective, or, as one could call it, *dianoetic* conception of thinking, remain for the most part implicit. Drawing conclusions about what an author's views on thinking were from an actual bit of thinking (such as the argument of B8 in Parmenides' case) or from the role explicitly ascribed to it (as in the case of Anaxagoras' "intellect" in B12) is quite different from interpreting explicit statements about what thinking is. Moreover, there are reasons to doubt whether the *activity* of thinking was of any concern in the first place: for instance, it is significant that when Empedocles says that thinking is blood, he identifies it with its *location*,[30] as if what thinking consists in was taken for granted. Thus it could be the case that seemingly good candidates for a "dianoetic" conception of thinking processes coexist with or rather turn out to fit the "intuitive" or "noetic" mould. After all, it is not before Plato that the difference between *dianoia* and *nous* was articulated.

The specific question about how early Greek philosophers conceived of the relationship between sensation and thought, raises the same kind of difficulty as the one concerning the nature of thought. Again, the explicit evidence is scarce. That at least one of them must have explored this relationship is certain, for Plato refers to such theories in the *Phaedo* as typical of their interest:

> Is it blood that we think with, or air or fire? Or is thought due to something else, namely the brain's providing our senses of hearing, sight, and smell, which gives rise to memory and opinion, and ultimately, when memory and opinion have acquired stability, to knowledge? (96a-b)

Curiously enough, however, our main direct evidence on this topic is negative, as it comes from Parmenides and Heraclitus.[31] Which is not to say that it is not interesting; on the contrary, these testimonies give grounds for thinking that even antiempirically minded thinkers could "save the senses" in a way that makes them much more important than one might have thought.

Take Parmenides B7.3-6 first:

> Nor let custom born of much experience force you to ply along this road
> an aimless eye and echoing ear
> and tongue, but judge by discourse a much-contested testing
> spoken by me.[32]

Despite apparences, I think it is a mistake to say (as is often the case) that Parmenides *rejected* the senses. What is true is that the senses cannot contribute to knowledge of truth. But what Parmenides' goddess promises is to teach mortal opinions as well as knowledge of the truth (B1, B10). Now certainly this implies exercising sense perception and exercising it in a correct way. It should be stressed that B7 does speak about sense perception.[33] Although the two terms *akoê* and *glôssa* imply understanding and speech, not sensation, the linkage of *akoê* with *omma* must refer to sight and hearing. Now, what should we do with the epithets *askopon* and *êchêessan*? A majority of interpreters assume that their function is definitional. According to this view, eyes and ears are by nature "aimless" and "hollow" (literally "echoing"). But something is to be said in favour of a more restrictive construal. Parmenides does not here simply reject the use of the senses, but does so only in as much as they are "aimless" and "hollow," that is in as much as they contribute to the deeply entrenched habit linked with experiential knowledge (*ethos...polypeiron*).[34]

This being said, we can be certain that Parmenides did not explain what the positive, "targeted," use of the eye might be (how to look properly for instance at the moon's wanderings), or what the "full" use of the ear is like (how to listen rationally to human discourse). In this respect, he is rather close to Heraclitus B107 ("Evil witnesses are eyes and ears for men, if they have souls that are barbaric"[35]) or B55 ("all that of which vision and hearing are learning, this is what I prefer"[36]). The implication of both fragments is that, under certain conditions (of wisdom or insight), the senses might well be "good witnesses." Empedocles thought this too, for he urged his disciple Pausanias to exercise sense perception in a full-blown way – the only way in which the senses could transcend their fragmentariness and help to achieve the synthetic grasp that he made the distinctive mark of thinking:

> But come, observe with every power in what way each thing is clear, without holding any seeing as more reliable compared with hearing, nor echoing ear above piercings of the tongue; and do not keep back trust at all from the other parts of the body by which there is a channel for understanding, but understand each thing in the way it is clear. (DK 31 B3)

3. THE PHYSIOLOGY OF SENSATION AND THOUGHT

In rough contrast with the epistemological questions we have touched upon, we are fairly well informed, thanks mainly to Theophrastus' treatise *On the senses*, about how sensation and thought function physiologically. There is a tendancy to oppose this purely physiological interest to a nobler, more philosophical one, which would presumably bear on those very epistemological questions that are so elusive in the extant evidence. This imbalance in our sources between epistemological and physiological considerations may in part be due to the hazards of transmission, but I am inclined to think that there is something authentic about it, provided that, following Plato's and Aristotle's use of the word *physiologoi*, we redefine what physiology means when applied to the early Greek philosophers.

On the basis of Theophrastus' detailed presentation, one can see that beginning at least with Empedocles, doctrines about sense perception tend to fight on common grounds. For all their differences, they operate with a relatively closed set of data, beliefs, and questions. This is especially clear in the case of vision, which, as is only to be expected, attracts much of the attention: as far as cognition is concerned, it is the most important of all the senses (together with hearing), and the eye is aesthetically as well as emotionally one of the most valuable parts of the human body. Almost every theory has something to say about the function of the watery substance on the surface of the eye (Theophrastus, *Sens.* 7, 26, 50) or about the image of the object that is reflected in the pupil (Theophrastus, *Sens.* 36, 40, 50). There is a typical and remarkable pattern in the overall presentation of the theory. In Theophrastus' reports about Empedocles, Anaxagoras, and Diogenes, the explanation of how the different senses work is followed by a section devoted to differences in acuity, both within a given species, namely human beings, and between human beings and other animals (8, 11, 29, 40, 50, 56). Why certain individuals, or certain animal species, see better at night than during the day is also part of the menu (8, 27, 42), as well as the topic of the relationship between perception on the one hand, and pleasure and pain on the other hand.[37]

In spite of deep disagreement in the explanations themselves, the *types* of explanations also reveal a set of relatively homogeneous preoccupations.

Sensation itself is never a problem. It is rather, something like a given capacity, whether it is attributed to the elementary principles (as in Empedocles and Diogenes) or to a specific organ (as in Democritus). What needs to be explained in the first place, is the way in which the object of perception meets the perceiving organ. Hence a double emphasis on what can be called "topology": early Greek doctrines about the senses are largely stories about travelling, going through, and reaching.

The object does not itself penetrate the organs but reaches them by delegation only. Accordingly, the classical scheme is that of Empedocles' "emanations," which are perhaps already foreshadowed in Parmenides.[38] It is significant that Democritus' *images*, usually called *eidôla*, could also be referred to as emanations (see especially 50, 51). One particularity of Democritus' theory, on which Theophrastus insists at length (50–53), is that those images do not themselves reach the eye. What gets into the eyes are "imprints" (*typoi*) that the images coming from the object, as well as our own emanations, have impressed on the intermediary air (51). The rationale for adopting such an intricate scheme must have been that it facilitated explanation of perceptual deformations, as well, perhaps, as the perception of distances. According to Aristotle's famous testimony about Democritus' theory of vision, if the sky was void of air, we would see an ant on the celestial vault (*De an.* II.7 419a15-17).[39] As far as transportation is concerned, it is more difficult to see what Anaxagoras' and Diogenes' views were. But Anaxagoras' point in adopting the common view according to which the image of the object is reflected on the pupil (27, cf. 36) may have been a particular instance of the principle that "what appears is vision of the invisible" (DK 59 B21a). In this case, some kind of transportation must have taken place, since the image in the eye was there. And when Diogenes claims, strangely enough, that the image on the eye must "mingle" with internal air in order for perception to occur (40), he implies that the image itself must have reached the eye.

The counterpart of this interest in emanations is the attention paid to "passages" (called *poroi* by Empedocles). There are many of these. In the first place, there are the passages constitutive of the sense organs – ears and nostrils are the most obvious instances. But how is the eye penetrated? Empedocles describes how "passages" of fire and earth alternate at the surface of the eye, so that it can receive what is shining and what is dark (Theophrastus, *Sens.* 7). Democritus invokes "suppleness" and "vacuity" to explain how the "image" penetrates the eye (50, 54), Alcmaeon (perhaps) and Clidemus (certainly), speak of its "diaphanous" nature (26, 38). Beyond the eye, the way must be clear, the channel pierced in a straight line, free of greasy matter or blood (Democritus, 50, cf. 55/56; Diogenes, 40). If the tongue, in Diogenes, is the organ most sensitive to taste and pleasure (the same word in Greek: *hêdonê*), this is because it constitutes the point where the vessels coming from the whole body concentrate (43). On the other hand, if fish as well as young children are stupid, this is due to air being unable to disseminate, in the case of fish, because their flesh is too compact, and in the case of children, because there is still too much of the original humidity blocking the channels (44, 45). Passages can be minute, even invisible. Empedocles held that we respire through the skin (DK 31 B100) and Democritus admitted that sounds penetrate through the whole body, not through the ears only (55).

The key function of passages in early Greek theories of perception perhaps explains the paradoxical status of touch. Aristotle remarks in the *De sensu* that early Greek thinkers, prominently represented by Democritus, had promoted touch to the principle of explanation of the other senses (442a29). Theophrastus agrees in Democritus' case (*De sensibus* 55), and says about Empedocles that adaptation to the passages is a kind of touch (15, cf.7). No doubt this analysis in part reflects the Peripatetic doctrine that all sensations, including touch, operate through a *medium*.[40] On the other hand, touch is strikingly neglected in early Greek theories. Anaxagoras is the exception. Theophrastus thinks it worthwhile to report his opinion, because it played a role in establishing, against most other thinkers, the principle that sensation occurs though opposites (28, cf. 2),[41] but he insists that others have almost nothing to say about touch. This silence is extremely revealing. If touch does not as a rule require independent consideration, that is because it does not imply any kind of travelling. In this sense, Aristotle's remark is justified; touch, potentially at least, is an *explanans* rather than an *explanandum*.

No wonder, then, if interest in the specific senses decreased proportionately to their proximity to touch. Taste requires attention only if distance is reintroduced by the admission of a central organ, and hence of an internal distribution, as in Alcmaeon (25) and Diogenes (43). On the other hand, Empedocles (9), Anaxagoras (28), and Democritus (72) have nothing distinctive to say about it. As for smell, it does presuppose distance, but one that is also immediately suppressed through respiration. This is what the standard explanation amounts to in saying that it occurs "together with respiration"

(Empedocles, 9, 22; Alcmaeon, 25). If this is true, we may be tempted to conclude that if sight and hearing are the most interesting among the senses, this is not only because they are epistemologically rich and physiologically complex but also because more work is needed to explain how contact is possible in their cases.

Getting into more details would lead us too far afield. The point I would like to conclude with is of a more general nature. Topological explanations surely reflect a great deal of physiological interest. Physiology, as always in early Greek philosophy, is by itself of a philosophical nature, because it cannot be detached from a set of general principles that are ultimately ontological in scope. Empedocles and Anaxagoras, who in a sense are the two central figures of Theophrastus' treatise, as they embody the opposition between two ideal types of explanations of cognition (through the similar, through the opposite), are paradigmatic in this respect too.

Like every other bit of Anaxagoras' theory, his explanation of sense-perception tells a story about difference, domination, and even violence. It is well-known that according to Anaxagoras, snow, which appears to be white, is black, since it is made of water (DK 59 A97). Sense discrimination is always one-sided, it only reveals what dominates in its object. But the discriminating power of perception would itself be impossible if *we* were not different from what we perceive. This is so to speak the material expression of the weakness of the senses, which operate within and thanks to the mixture that only *nous*, as the only unmixed entity (B12), can separate.[42] If we can distinguish sweetness, this is by contrast with the sour that is in us. Perceptions will be more accurate, the stronger the contrast is. What is at stake in perception is a certain strength-ratio (27, 37). This explains the crucial role played by the size of the perceiving organs, and more generally of animals, in Anaxagoras' theory. It also explains that, according to Anaxagoras, there is no sensation that is not painful. Even if we do not notice it under normal circumstances, both excessive perceptions and the need to sleep show the damage accumulated while exercising the senses.

This cluster of features is best read against the backdrop of Empedocles' theory, whose story is largely teleological (in as much as Love, in the person of Aphrodite, acts as a craftsman) and even eschatological. For Empedocles, perception and thought are occasions of excellence: they allow distinctions and hierarchies. This is the reason why the section of his poem dealing with thinking led to a treatment of intellectual gifts and craft knowledge[43] which seems to have been without parallel in other thinkers. The main theme that organizes his analysis of cognitive capacities, however, is that of fragmentation and synthesis. Travel is not only necessary for contact and thus perception to take place; rather the other way round: perception is one way for the elements to come together. In the perceptual process, the encounter of the elements is only temporary. When water finds water (this is what the perception of dark objects consists of), or fire finds fire (when the perception is of bright objects), air and earth are left aside.[44] From this point of view, thought, in which all the four elements are at work (for blood is an harmonious composition of all four elements), only intensifies a movement of unification that is already discernible in sense perception. Whether sensation or thought, every cognitive act is the anticipation, within the limits of human life, of the ultimate fusion of the elements in the unity of the divine Sphere. These are acts of love, and this is why they are linked to pleasure.[45]

The beautiful correlation between Anaxagoras' and Empedocles' views on thought and the senses on the one hand, and their overall philosophical world-view on the other hand, is also to be found, or at least suspected, in other thinkers, such as Diogenes of Apollonia[46] or Democritus, even if, in the latter's case, the bulk of his systematic interest was on the sensibles (the atomic forms) rather than on the senses themselves.[47] This is less true of other thinkers because of the state of our information, or because of the kind of philosophy they practised (Alcmaeon for instance, though a physicist, must have had strong medical interests[48]). The balance between scientific programme and systematic interest, even in the most skilful thinkers, is a delicate one. One could even argue that there is in any given author, and from one author to another, a certain tension between his systematic project and the obligation to comply with some kind of scientific programme – a programme implicit in the set of relatively closed data and questions I have alluded to before.[49] But on the whole, one can say that early Greek philosophers succeeded in integrating cognitive processes, no less than cosmological phenomena, with their physiological approach. This may have been at the cost of an epistemological consciousness that would be more congenial to post-Socratic, or more precisely post-Platonic, interests.

NOTES

1 As was shown by Solmsen [497] 160–64.

2 Descartes, *Second meditation*: "What is a thing that thinks? A thing that doubts, understands, affirms, denies, is willing, is unwilling, and also imagines and has sensory perceptions." ("Qu'est-ce qu'une chose qui pense? C'est-à-dire une chose qui doute, qui conçoit, qui affirme, qui nie, qui veut, qui ne veut pas, qui imagine aussi, et qui sent.")

3 For the semantic aspects of the history of the word *psychê*, see Jouanna [493].

4 See below, p. 261.

5 See Snell [128], with critique by T. Jahn, *Zum Wortfeld 'Seele-Geist' in der Sprache Homers* (Munich, 1987).

6 Claus [486], to whom I owe the title of this section.

7 Jarcho [492].

8 Burkert [201] 120–65. See Huffman in this volume p. 70.

9 Huffman [198] 330.

10 See Riedweg [367].

11 See Furley [489].

12 *De an.* I.2 405a19-21 = DK 11 A22. The assimilation of "All is full of gods" to "Soul is everywhere" is explicitly presented by Aristotle as a conjecture (*De an.* I.5 411a7).

13 The fragment is sometimes considered inauthentic, as betraying later influence (Diogenes of Apollonia or the Stoics). For a discussion, see Whörle [188] 63–64.

14 As Huffman [198] 307–14 suggests it is.

15 Aetius, IV.3.5 (= DK 68 A102) and IV.8 (cf. IV.2), cf. Aristotle, *De an.* I.2 404a5.

16 The information about Diogenes is in Theophrastus (*Sens.* 44), who is not helpful, however, as far as Democritus is concerned (58); see below p. 259. On the function of the brain for Democritus, see Sassi [421] 73ff. as against Bicknell [410].

17 As translated by Kahn [416].

18 DK 22 B12, 36, 45, 67a, 77, 85, 98, 107, 115, 117, 118, as well as a group of fragments where the term seems implied with various degrees of probability (B26, 88, 136, A16). Cf. Nussbaum [256].

19 See Claus' [486] and Schofield's [261] critiques of cosmo-physiological interpretations of the *psychê*-fragments, as represented for example by Mansfeld [255]. For further discussion of Heraclitus' account of *psychê*, see Hussey in this volume p. 101.

20 I take it in the reverse order of Aristotle's presentation, leaving aside the group of anonymous thinkers, which raises problems too intricate

to be treated here. For a full study (including the question of order), see Mansfeld [40].

21 The text and the meaning of the fragment are much disputed. For references, and an attempt to understand *to pleon* in the last line as saying that "the full" (not "the more," or "what prevails") "is thought," see Laks [301].

22 See below, p. 263, 266.

23 Sedley [378] 26–31, thinks that the principle "like knows like" in Empedocles applies only to thinking (cf. DK 31 B109). Although *On the senses* does make a scholastic use of the traditional two principles "like by like"/"different by different" (for which see Müller [496]), I do not think that Theophrastus misrepresents Empedocles' doctrine here.

24 Contrast Theophrastus' use of *hôs* with *phasi* in the *De anima* passage and *hypolambanein* in the *Metaphysics* passage.

25 On Xenophanes and Heraclitus, see Lesher in this volume pp. 228–36, and Lesher [494] 13, 20–23. On Democritus, see Taylor in this volume pp. 196–7.

26 We find the same kind of assesment in Theophrastus, fr. 227 FHSG.

27 See DK 31 B3, p. 262 below.

28 For a defence of the transmitted text (*meta tên kinêsin*), see Sassi [421] 187ff. With the usual correction (*kata tên krasin*), the text reads: "when soul is balanced in its mixture."

29 Lesher [494].

30 See Long [366] 268.

31 Lesher has argued forcefully for Xenophanes' commitment to empirical observation (see p. 230 in this volume), but this is a matter of reconstruction, and the question of empiricism reaches far beyond that of the relationship between sensation and thought (although both questions are obviously related).

32 Tr. Lesher [494] 24.

33 For doubts about this, see Mansfeld [40].

34 This interpretation may gain some support if one takes *logôi* not as "reason," but simply as argument (Lesher [494] 24, n. 46, and in this volume p. 239).

35 As the word *barbaros* in Greek means "who does not speak Greek," "barbaric" in Heraclitus' fragment is often taken to imply that the souls in question "do not understand the language of the senses." This seems doubtful, but see Hussey in this volume p. 90.

36 Adopting the construal of the sentence by Mansfeld [12] vol. I, 254, which must be right.

37 There are reasons to think that Empedocles was the one who set up the agenda.

38 This is at least one possible explanation of why cognition requires some *symmetria* (Theophrastus, *Sens.* 3, to be compared to the criticism of Empedocles' theory in 15).

39 Democritus' account of vision is much discussed. See K. von Fritz, "Demokritos Theorie des Sehens" in his *Grundprobleme der Geschichte der antiken Wissenschaft* (Berlin, 1971) 594–622, and O'Brien [419].

40 Cherniss [34] 314–16.

41 Theophrastus' classification of previous theories of sense perception relies on an opposition between those who explain sensation in terms of "similarity" between the perceiver and the object perceived, and those who assume some "dissimilarity" or "opposition." On this, see Mansfeld in this volume p. 30.

42 On this, see Laks [394].

43 This is the implication of Theophrastus' report in *Sens.* 10–11.

44 Theophrastus *Sens.* 10–11.

45 See Bollack [356] vol. 1, 263–64.

46 On whom see Laks [425].

47 This aspect of the problem has been omitted here. The reader may refer to the second part of Theophrastus' treatise.

48 The problem of Alcmaeon's intellectual profile is treated in Mansfeld [495].

49 This, of course, concerns cosmology no less than physiology, in the restricted sense of the term.

MARIO VEGETTI

13 Culpability, responsibility, cause: Philosophy, historiography, and medicine in the fifth century

"The idea of nature as implying a universal nexus of cause and effect comes to be made *explicit* in the course of the development of Presocratic philosophy": G.E.R. Lloyd.[1] "The conception of *cause* is borrowed from the language of medicine, as is clear from the word *prophasis* which Thucydides uses": W. Jaeger.[2] "The word *aition* is, from the Hippocratic writings on, a standard word for 'cause', and its relative *aitia*... meant a complaint or an accusation, but already by the time of Herodotus's book it can mean simply 'cause' or 'explanation' ": B. Williams.[3]

These three distinguished scholars, distant though they are from one another in their intellectual orientations, seem to agree on the opinion that a precise and well-defined conception of causality is present in fifth-century philosophy, history, and medicine. This judgement is widely shared, but it needs to be corrected, or at least clarified and formulated, from two different but complementary perspectives.

First, as we shall see, lexical investigation of causality (*aitia, aitios, to aition, prophasis*) shows that explicit theoretical reflection on causal connections and forms of explanation based upon them emerged only gradually and with considerable uncertainty from the fuzziness of moral, political, and judicial language to do with culpability, responsibility, and imputability of facts and actions. Interestingly, the conceptualization of causality developed in medical contexts rather than in early Greek philosophy (judging from the fragments of the latter and setting aside the causal formulations provided by Aristotle and Peripatetic doxography).

Second, there is a need to clarify the relationship between the development of theoretical reflection on causality and the kind of causal connections it describes. For example, Aristotle's treatment of "cause" in book two of his *Physics* does not include a Humean conception of causal connection, according to which the cause is the necessary antecedent of the effect. In this respect, he is faithful to the complexity of fifth-century thought; he tends to reproduce, albeit in the context of a rigorous theory, the diverse dimensions of causality that were beginning to emerge there more or less vaguely. On the other hand, a conception of a cause as that which is necessary and sufficient to bring about the effect is found in a part of the medical testimonies, and in this respect, it prefigures Stoicism rather than Aristotle.

Fifth-century thought was largely lacking in any explicit theoretical reflection on the problem of causality and in a "strict" conception, in the Humean sense, of causal connections. But it was quite capable of conceiving (more or less spontaneously) relationships between things and events that later theory would have included in the general context of causality. What we need to recognize is that these relationships came to be described in terms that are different from the language of causality that I will analyse in this chapter.

There are, for example, phenomena that occur "by nature" (*physei*), that depend on the regularity of the world's natural order. This dependence is often described, both in philosophy and medicine, as "necessity" (*anankê*). Sometimes this necessity can be connected, not to natural regularity, but to the decrees of destiny and divinity, as in Agamemnon's famous statement: "Not I am culpable (*aitios*) but Zeus, Moira and the Erinyes" (*Il.* XIX.86). The necessary dependence of events on the plan of destiny occurs frequently in Herodotus with the expression, "as had to happen" (*edei*). If the regularity on which the events depend is not divine or natural but human, the connection is often expressed, especially in political and judicial contexts, with the weaker term *eikos* (plausible, probable, likely).

Yet, these connections of dependence between things, events and forms of order can only be brought within the context of causality and causal explanation by using later thought patterns. To demonstrate this, let us briefly survey some clear examples from early Greek philosophy, starting with the famous fragment of Anaximander, reported by Simplicius (DK 12 B1):

> The source of coming-to-be for existing things is that into which destruction, too, happens "according to necessity; for they pay penalty and retribution

(*dikên kai tisin*) to one another for their injustice according to the assessment of time." (tr. KRS, 108)

The universal and necessary connection that binds things in the cosmic cycle is evidently conceived here in the moral/juridical terms of guilt and punishment rather than those of causal explanation.

In the immediately succeeding philosophers, we find the widespread idea of a dependence of things and processes on the "power" of an originating principle (*archê*). Thus, Parmenides (DK 28 B12): "The *daimôn* that governs and rules (*archei*) all things." There appear, especially in Empedocles and Anaxagoras, principles that much later would be interpreted as prefigurations of (efficient) causality: in the first case, Love and Strife (*philia* and *neikos*), in the second case Intelligence (*nous*). These principles exert their actions on other originating principles of a biological kind, such as the "roots" (*rizômata*) of Empedocles and the "seeds" (*spermata*) of Anaxagoras.

Now in Empedocles' text (see, for instance, DK 31 B26), Love and Strife seem to be somewhat anthropomorphic metaphors for the cosmic elements' aggregation and separation, and not separate from the elements themselves. In any case their action is expressed in the political language of power (e.g., DK 31 B17.28: "They prevail (*krateousi*) in turn as time goes round"). In contrast with Empedocles, Anaxagoras' principle Nous is explicitly conceived as separate from the things on which it exerts its own action. This is probably why Plato in the well-known passage of the *Phaedo* (97b ff.) refers to Anaxagoras as the initiator of the idea of final causation. Yet, the way Anaxagoras expresses Nous' separation and its action on the world is once again the language of political and military power: Nous is "authoritative" (*autokrates*), exerts its own force (*kratein, ischeuei*), and has the power (*archê*) of initiating the rotation of the world (DK 59 B12). Thanks to this power that it has, Nous imposed order on all things (*panta diekosmêse*). This conception of a regulating activity has probably influenced the way Plato in the *Timaeus* thinks of the Demiurge's action on the spatiotemporal world. It seems clear that this embryonic form of causal thinking is still completely clad in metaphorical language derived from the political sphere. The need to explain the beginnings of the cosmic order does not imply a theoretical reflection on the concept of cause, but rather it is forced to express itself in terms of the power that the gods exercise in the world or that men exercise in society, just as in Anaximander the language remains juridical and ethical.

To approach the question of how causal thinking began, we cannot improve on the words of Michael Frede:

> When the use of 'aition' was extended such that we could ask of anything 'What is the aition?', this extension of the use of 'aition' must have taken place on the assumption that for everything to be explained there is something which plays with reference to it a role analogous to that which the person responsible plays with reference to what has gone wrong; i.e., the extension of the use of 'aition' across the board is only intelligible on the assumption that with reference to everything there is something which by doing something or other is responsible for it.[4]

My aim in this chapter is precisely to verify, by correcting the widely shared opinions mentioned at the beginning, just when and how this extension, conceptualization, and generalization of causal thinking took place. In other words, when did the transition occur from the personal language of culpability and moral, political, and legal responsibility to the abstract and "neutralized" language of cause? (This does not necessarily imply, as we shall see, the substitution of the neuter substantive *to aition* for the forms *aitia* and *aitios*.) We shall be dealing with a lengthy and complex process, one that spans all of fifth-century thought and that left a profound trace even on the more developed theorizing of Plato and Aristotle.

THE PHILOSOPHERS

The surprising result that emerges from lexical investigation of causality in the early Greek philosophers is the virtually total absence of any reflection on the problem of causal explanation. This is surprising because, of course, the evidence on them includes abundant references to the language of cause. Yet, from our perspective in this chapter, that evidence has no value whatsoever because it depends entirely on Aristotle's interpretation, found in book one of his *Metaphysics* and book two of his *Physics*. There Aristotle looks at these thinkers as imperfect predecessors of the research into causality carried out by himself. When instead we focus only on the fragments that, to some extent, reflect the early Greek philosophers' original language, the terminology of causality proper is virtually absent. What we find is terminology that conforms completely to the traditional moral and juridical connotations.

Aitia occurs only once in Democritus (DK 68 B83), with the meaning "reason" or "motive." *Prophasis* for its part has the meaning of "excuse" or "justification" (DK 68 B119), which is quite normal among historians and doctors.[5] In Gorgias *aitia*, which occurs in the *Helen* and *Palamedes* (DK 82 B11, 11a), naturally retains the significance of "culpability" or "responsibility," which is standard in moral and juridical discourse. The term is used in the same Gorgianic way by Antiphon in his *Tetralogies*. These rhetorical exercises, designed to prepare people for argument in the law courts, make a strict connection between legal responsibility and culpability or religious pollution (*miasma*).[6]

In his second *Tetralogy* the question at issue is the responsibility of a youth who, in the course of training, threw a javelin, killing one of his associates who had inadvertently entered the grounds of the gymnasium. This type of problem resembles an anecdote told by Plutarch with reference to Protagoras and Pericles (DK 80 A10). They had spent an entire day discussing those who were responsible (*aitioi*) for the involuntary killing of a certain Epitimus, in circumstances similar to those treated by Antiphon. This was clearly an exemplary legal question: Who or what was reponsible, the javelin, the thrower, or the gymnastic officials?

We are not dealing in these cases with "speculation on cause and effect," as Adkins has suggested in regard to Gorgias, treating that as one of the main themes of the contemporary sophists.[7] The evidence points rather to a debate on questions of responsibility and culpability both in a moral and religious context – a debate that reaches one of its high points in Sophocles' *Oedipus at Colonus*, where Oedipus declares himself morally and legally innocent (*katharos*) because his crimes were involuntary (lines 546–8; see also 266–72) – and in the legal sphere, as with Gorgias, Antiphon, and the story about Protagoras.[8] The same issue, as we shall see in the next section, occupies a central position in the historians' thoughts about political actions.

It seems certain, then, that neither in their physics nor in their sophistic debates were early Greek philosophers concerned with any theoretical work on the language and concepts of causation in general. To discover the first traces of this, we need to extend the investigation into the fields of historiography and especially medicine.

THE HISTORIANS

The history of Herodotus begins with a discussion of the *aitia* for the wars between Greeks and barbarians. At issue here are the reasons or motives of war, but these consist of a reciprocal dispute, an exchange of charges for the responsibility for crimes committed and for acts of retaliation. In the eyes of the Greeks, the Phoenicians are *aitioi*, culpable for the wrongs (*adikêmata*) committed against them (I.1). But the Greeks in their turn are culpable for *adikia* against the barbarians and at the end are considered "greatly culpable" (*megalôs aitioi*, I.4.1) for the aggression deployed against Troy. Throughout Herodotus the normal meaning of *aitia* remains "charge for a crime committed," and also "culpability" that constitutes the motive for punishment (cf. I.137.1).

This use of *aitia* (and correlatively of *aitios*) is a clear extension of judicial language into the context of political disputes. In some cases (e.g., IV. 167.3) the charge is only a "pretext" (*proschêma*) adopted to justify a violent act. The association of this word with *aitia* is interesting because in one place (IV.133.1) *proschêma* is linked to *prophasis*, and *prophasis* in Herodotus has exactly its normal meanings, "pretext" or "excuse" (cf. IV.145.1). Now, if *aitia* partially overlaps *prophasis*, that is certainly not a move in the direction of causal language, but rather an indication that we are dealing with the exchange of charges, imputations, excuses, and pretexts that are typical of legal and political disputes. *Prophasis* can also take on the meaning – consistent with but slightly different from pretext – of "chance circumstance," by means of which something predestined takes place. Thus Herodotus introduces the story of the Scythian King Scyles' ruin: "Because it was destined (*edei*) that things would go badly for him, this was the occasion for it" (*apo prophaseôs toiêsde*, IV.79.1). So *prophasis* also signifies the obvious and visible aspect of a hidden destiny.

Up to this point, as has been seen, Herodotus' language does not depart from the traditional uses in contexts of justice, ethics, politics, and religion. However, vague signs can be found of a shift towards an embryonic transference from the domain of responsibility to that of causality. In discussing the reasons for the flooding of the Nile, Herodotus reports the opinion that the etesian winds are responsible (*aitioi*) for it, and refutes it on the basis of the fact that the flooding occurs even if these winds are not present (II.20.2-3). The passage can certainly be read as acquitting the winds of blame, but it also hints at an important requirement of causal thinking, the presence of the cause in connection with its effects. In the same passage, Herodotus declares that in his own view the sun is responsible (*aitios*) equally for the flooding and for the air's dryness in Egypt (II.25.5-26.1). Here too we find a vague hint of transition from the language of imputability to the conception of causality.

Other passages, all of a hesitant or negative kind and featuring the nominalized adjective *to aition*, admit to the same interpretation. Thus (VII.125): "I am puzzled about what the motive (*to aition*) was that compelled (*to anankazon*) the lions to spare the other animals and to attack the camels, a creature they had never seen or had any experience of." The hesitant tone of the passage implies the sense: "I don't know how to find an explanation for this event." What is clear is that, just as in the discussion of the Nile's flooding, we are witnessing a transition, however vague and unarticulated, in the direction of a type of causal thinking.

The beginning of Thucydides' *History* is entirely Herodotean – to describe the charges and quarrels (I.23.5: *aitiai/diaphorai*), that is, the motives (*aitias*) publicly adopted for the outbreak of war between the Athenians and the Spartans (cf. I.146). The sense that Thucydides normally gives to *aitia* in reference to political controversies is an extension of its usage to signify responsibility or culpability in juridical or ethical contexts. Hence, it is frequently associated with *hamartêma* (error of fault) and *adikein* (wrongdoing) (e.g., II.60.4-7, I.39.3, IV.114.5). In the debate between the Corinthians and the Spartans (I.69.6) *aitia*, a "complaint" brought against friends who err – hence a term free from hostility – is contrasted with *katêgoria* an "accusation" that is directed against enemies. However this psychological nuance, even if it originates from judicial language, is not consistently adopted by Thucydides, who often uses *aitia* in reference to antagonists.

A move in a decidedly causal direction has often been seen in the celebrated passage (I.23.6) where Thucydides, after setting out the complaints and charges exchanged between the Athenians and

Spartans, adds that "The truest *prophasis*, although the one least manifest (*aphanestatê*) in the debates," was the fact that the Spartans were forced (*anankasai*) to make war from their fear of the growing Athenian power. What needs to be emphasized here is that *prophasis* does not mean "the ultimate cause" as distinct from the stated pretexts (*aitiai*). The word *prophasis* (derived not from *phêmi* but from *phainô*, as Irigoin has shown) means "to show, to bring to light."[9] Thucydides contrasts this *prophasis* with the speeches of the combatants that conceal the true reasons for the war. What he means, then, is, "The truest reason that I can exhibit, notwithstanding the fact that it was not stated publicly," was actually the unavoidable situation, both psychological and political, in which the Spartans found themselves.[10] We are again in the general vicinity not of causal thinking but of the courtroom – the discovery of a hidden motivation.[11]

More important and more difficult to interpret is a passage on the plague at Athens (II.48.3) where the crucial word is not *prophasis* but *aitia*. Thucydides writes, "As to the plague, let anyone, physician or layman, state, to the extent of his knowledge, from what source it probably (*eikos*) originated and what he thinks (*nomizei*) were the causes (*aitias*) of this catastrophe sufficient to have the power (*dynamis*) to produce it." The occurrence of terms like *eikos* and *nomizein* here may suggest that we are again in a context of imputing responsibility and blame (as in Herodotus II.25.5 cited above). Yet, the connection of *aitia* with *dynamis*, in the sense of "capacity to produce effects," undoubtedly gives this passage a distinctly causal sense and aligns it with certain medical texts such as *Ancient medicine* that make a still greater advance in this direction. We should note that there, as here in Thucydides, the causal expression is *aitia*, not *prophasis* or the neuter form *to aition*.

This last term, which Thucydides does not use very frequently, normally means "motive" in a quite general sense.[12] However, there is one interesting occurrence of it in a passage very similar to those we have cited from Herodotus. In regard to a tidal wave, Thucydides states his opinion of the cause (*aition*, III.89.5), "an earthquake without which I do not think such an event could have happened." Here we observe not only the extension of the concept of responsibility to any phenomenon (Frede's point about the origin of causal thinking) but also a formulation, as in Herodotus, of the necessary presence of the cause in connection with its effect. Here too we can see the beginning of a transition towards a form of causal thinking, but it is still vague and without any conceptual generality. It is among the medical writers that we shall find a more decisive step taken in this direction.

MEDICINE

The medical material that could be discussed for our purpose in this chapter, even confining it to the fifth-century writings, is too extensive to be investigated fully here. Instead, I shall limit myself to considering a number of crucially important texts that provide the coordinates for a map of the medical thinking relevant to our topic. So far as their relative dates are concerned, we know too little to proceed on a chronological basis, and in any case, we can find divergent positions adopted in Hippocratic texts that are probably contemporeaneous. We cannot speak of a univocal progress of medical thought during the fifth century, either for our own topic or for any other. At one extreme we find writings in which the language of causal explanation is completely absent or irrelevant. Thus, the words *aitia* and *prophasis* never occur in *De locis in homine*, regarded as one of the oldest works in the Hippocratic corpus (440–430?), and also from some points of view as one of the most authoritative.[13]

Terms for cause and responsibility are also nearly absent from a work as important as *Prognostic*, and here I need to clarify an equivocation widely found in the history of this work's interpretation. It has been long supposed (on the basis of an unconsciously positivist prejudice) that the prognostic functions of Hippocratic "signs" were based on their character as "causes": a sign (*sêmeion*) would thus be predictive because it constituted the cause of the effects that follow it in the duration of the disease. But this is entirely groundless.[14] The Hippocratic sign (which retains some affinity with the prophetic predictions from which it originated and with which it competed) is predictive because it represents the visible aspect of a constellation of phenomena to which it is linked with a regularity registered by the physician's memory and by the recording of prognostic manuals. It will suffice to cite on this a passage from *Prognostic* (sect. 4):

> As to the motion of the hands, I know the following facts: in acute fevers, pneumonia, phrenitis and headache, if they move before the face, hunt in

the empty air, pluck nap from the bedclothes, pick up bits, and snatch chaff from the walls – all these signs are bad and deadly." (tr. Jones)

The motions of the hands are certainly, in no possible sense, "causes" of the death, rather, because they are regularly associated with a fatal ending of the disease, they represent the visible level of its otherwise unseen progression; they are an aperture through which the invisible (*aphanes*) makes itself evident (*phaneron*) and therefore predictable. Neither *De locis* nor *Prognostic*, then, have any bearing on the formation of causal thinking.

An intermediate position on our map is occupied by three treatises: two of these, *On the sacred disease* and *Airs, waters and places*, are rather similar and relatively old, while the third (*On the nature of man*), which probably belongs to the beginning of the fourth century and plays an important role in consolidating Hippocratic thought, was as well known to Aristotle as to Galen. Let us begin with *On the sacred disease*, in whose opening lines (as edited by Littré) many (starting with Jaeger) have seen the inaugural declaration of a full-fledged theory of natural causality. In Grensemann's recent edition this reads: "As regards the so-called sacred disease [epilepsy] the situation is thus. It is not, in my opinion, any more divine or more sacred than any other disease but, just as others have a nature, from which they originate, so too it has a nature and a *prophasis*."[15]

The sacred disease has a natural (not a divine) origin and therefore a *prophasis* – an explanation, a clearly adducible reason, just like the war in Thucydides' prologue. The task of the Hippocratic treatise will consist in specifying this "public" explanation of epilepsy. By contrast, the author's opponents, magicians and purifiers, attribute the disease to the divine in order that, if the patients die, "they can have the excuse (*prophasis*) to advance that not they but the gods were culpable (*aitioi*)" (1.20). Here, as in Thucydides again, the language of *prophasis/aitios* slides clearly in the juridical direction of blame and exculpation, indicating a striking conceptual vagueness. This even returns in the statement with which the "positive" part of the text begins: "It is the brain which is responsible (*aitios*) for this ailment, as with all other serious diseases. In what way and for what reason (*prophasis*) it happens, I will clearly declare" (sect. 6). This language, on the one hand, recalls a speech in the law courts: the guilty party has been unmasked, and the methods and the motives of the crime have been revealed. But, on the other hand, *prophasis* (which, in the author's usage, refers to the action of warm winds on the brain from which the ailment originates) goes beyond this context in the direction of causal explanation.

The same critical point emerges even more visibly in *Airs, waters and places*. In this work (which was well known to Plato), we find frequent instances of the adverbial use of *anankê* to designate the necessary dependence of peoples' psycho-somatic characteristics on geography and climate.[16] This deterministic context also influences the meaning assigned to the terms *aitia/aitios* and *prophasis*.

In some cases we are not far from Herodotus' usage. Thus, for instance, the distinction between *prophasis* and *aition* (sect. 4): "Many abscesses occur for any reason (*prophasis*). The tension of the stomach and the hardness of the intestine are responsible (*aition*) for this." More complex is the text of section 16: for the differences of character between Asians and Europeans, the seasons, which in Asia do not produce strong variations of temperature, are responsible (*aitioi*). For these reasons (*prophaseis*), the author adds, "and also on account of their laws," which make them subject to monarchs, the Asians are weaker. It is very difficult to distinguish here between responsibility and cause on the one hand, and between explanation and cause in the strict sense on the other hand. This difficulty is due to more than one factor – the oscillation in the usage of terms, and the author's adoption of a doubly deterministic perspective (environmental and political), expressed by such phrases as "and also," which weaken the line of causation.

Still more interesting is the conceptual structure of section 22, where the topic is the reasons for the prevalent impotence of the Scythians, who "attribute the blame (*aitia*) for it to the gods." According to the author, the affliction is due to the Scythians' habit of riding, to swellings of the joints that ensue, and to the cure that they practise on themselves, cutting the veins behind their ears. Their impotence is due to this cluster of reasons (*prophaseis*), "and also" because their habit of wearing trousers and of riding prevents them from masturbating so that they forget about sexual desire. It is clear that the plethora of reasons adopted by the author cannot amount to a genuine causal nexus, but rather to a system of explanations (signified by *apo/dia*) that serves to invalidate the imputation of the ailment to the divine and to restore it to the natural level of demonstrable evidence. (The same purpose is served by the author's argument that impotence affects only the wealthy Scythians, who can afford to ride, which would not happen if the ailment were of a divine origin because they can ingratiate themselves with the gods by offering numerous sacrifices.)

Rather than a cause, we can speak here (as in connection with the double determinism of environment and politics) of the convergence of a plurality of circumstances or reasons that serve the needs of rational explanation. The conceptual vagueness surrounding causality can also be regarded in such passages as a richness in the forms of explanation that will still be echoed in Aristotelian thought.

In *On the nature of man*, we find language that is similar though less complicated. When faced with diseases of an epidemic character, we are told (sect. 9) "that it is necessary to impute the responsibility" (*aitia*) to that which is common to everyone, namely, the air breathed in. But in cases where the pathology differs, the individual's dietetic regime will be responsible (*aitia*), and therefore therapy must attack the reason (*prophasis*) for the ailment. The possibility of ascertaining the reasons for the disease is interestingly connected with the ability to give a public account of its development (sect. 13). Here the language of *prophasis* is not far from Thucydides' statement about the reasons for the Peloponnesian War, but at the same time, the passage shows a decisive transition towards the sense of giving the cause. This transition appears still more clearly in a number of texts that reflect sophistic influence on medical writing, such as *On breaths* and *On the art*, datable to the end of the fifth century or the beginning of the fourth century.

On breaths begins with the style of a judicial inquiry: "All diseases have one and the same form and cause (*idea/aitia*). What this cause is I shall try to declare in the discourse that follows" (sect. 2). In this passage the author uses the word *aitia* as completely equivalent to the neuter form *to aition*. As if concluding his address to the jury, he writes:

> It is clear, then, that breaths are the most active factor in all diseases; all other things are concomitant and secondary causes (*synaitia/metaitia*), but I have shown that this is the cause (*aition*) of diseases. I promised to declare the cause of diseases, and I have shown that *pneuma* (inhaled air) has the

greatest power both in other things and in the body of living creatures. I have let my discourse dwell on familiar ailments in which the hypothesis has shown itself correct. (sect. 15)

This passage provides an extraordinary example of conceptual development formulated with the help of largely traditional language. The style is really what a contemporary would associate with the *logos* of a sophist or attorney. An inquiry is initiated and an accusatory hypothesis is formulated; at the end, the public and the court have been shown that the hypothesis is true, that the suspect is indeed culpable, and that the others charged are at most accomplices. (*Synaition* and *metaition* are often found in this sense in tragedy.)[17] On the other side, we have here the lineaments of a causal inquiry that is quite precise and strong, capable of exactly specifying the principal causal factor (*to aition*) and distinguishing it from causes that are merely concomitant and accessory. In this respect and also in its recourse to a hypothesis that awaits confirmation, this text of *On breaths* anticipates the celebrated passage of Plato's *Phaedo* (99a ff.), which is rightly regarded as the earliest philosophical reflection on causality. There too we find the distinction between the true *aition* and concomitant conditions (99b2-4) and the recourse to a hypothesis (100a3-4).

It is fairly probable (but uncertain owing to chronology) that the extreme causal reductionism of *On breaths* was one of the targets of *Ancient medicine* (1.1), where those "who introduce one or two hypotheses" and who "have a reduced conception of the causal principle" are criticized.[18] We shall have more to say about this. In the *De arte*, the usage of *aitia/aitios* still preserves a strict judicial or sophistical sense. Criticizing those who unjustly charge doctors with the death of their patients, the author, as the perfect advocate for the defence, exclaims (sect. 7), "They assign blame (*aitia*) to the one who is in no way culpable (*aitios*), while they allow the guilty to go free." But in the sphere of epistemology, this treatise does make an important conceptual development. The author writes (sect. 6) that there are no spontaneous "cures," because in the context of that which is explicable causally (*dia ti*), spontaneity (*automaton*) disappears, and that is precisely the context of medicine, a context in which causality (*dia ti*) governs phenomena and makes them therefore predictable.

It is clear that at the end of the fifth century in medical thought of a sophistic tenor, the causal structure of explanations in medicine had arrived, for the first time, at a level of appreciable conceptual generalization. It is in the medical context that this process achieves its final refinement.

ON ANCIENT MEDICINE

Ancient medicine, begins with a polemic against those who, "on the basis of one or two hypotheses," simplify the *archên tês aitiês* in a way that is too reductionist.[18] This expression could certainly be interpreted in the traditional way as the "culpable starting-point" for the onset of diseases (compare, for instance, the ancient charge (*palaia aitia*) that Oedipus mentions in reference to the murder of King Laius, Sophocles, *Oedipus Tyrannos* 109). But the context suggests a different interpretation, that is, "the starting-point of the causal process": in the hypotheses in question, elements or qualities of a physical kind, such as hot and cold, are viewed as the initiating cause of all diseases, like the "breaths" (*pneumata/physai*) in the similar context of *De flatibus*.

The conceptual divide between culpability or responsibility and causality appears definitely to have been crossed (in the sense indicated by Frede in our citation on p. 274) in another crucial passage of this treatise: "We must surely consider the cause (*aitia*) of each complaint to be those things (*tauta*) the presence of which of necessity produces a complaint of a specific kind, which ceases when they change into another combination" (19.3, tr. Jones).[19] This passage has generated some discussion, but there is no doubt that we encounter here the clearest, the most general, and the most conceptually precise idea of causality to be found in fifth-century thought (assuming, of course, that this is the chronology of *Ancient medicine*).

A cause can be considered such (1) when its presence produces a certain effect, (2) when this effect is necessarily determined and in a univocal manner, and (3) when its absence or alteration determines the failure of the effect. All this precisely anticipates not only the discussion already mentioned from Plato's *Phaedo* but also the definitions of cause more rigorously stated in Aristotle (*Metaph.* V.2 1013a31-32) – a cause is "the maker of what is made and the changer of what is changed," and even in Sextus Empiricus (*PH* III.14) – "A cause is that by whose activity an effect is produced."[20]

Ancient medicine, then, seems to inaugurate a new history of causal thinking, incorporating and completing the slow and uncertain process found throughout the fifth century in philosophy, history, and medicine itself. There is an element of continuity but what stand out more prominently are innovation and rupture at the level of rigour and capacity for conceptual generalization. The radical novelty of this treatise has not been adequately appreciated up to now because, as I began by saying, we have been accustomed to giving too optimistic an interpretation of causality to various aspects of fifth-century culture, overlooking conceptions that are actually tightly linked to the ethical and juridical sphere of culpability, responsibility, and imputation.

One can understand why, in view of *Ancient medicine's* radical innovations, some scholars have proposed to make the work completely post-Platonic, dating it towards the later years of the fourth century.[21] This theory is based on an erroneous historical assumption, which can be rapidly undermined, and on some plausible but quite inconclusive reasons. The assumption is that a doctor could not be the leading figure in such a conceptual development, and therefore it must depend on a philosophical thinker. Yet, on the contrary, it is perfectly legitimate to suppose that many philosophical texts are inspired by theories that originated in medicine, as Plato himself says explicitly in the *Phaedrus*.[22] So we are quite entitled to think that this is the case in the connections between the *Phaedo* and *Ancient medicine* in regard to reflection on causality. It is true, of course, that the traditional dating of the treatise (no later than the end of the fifth century) does require us to assign to it absolute originality, making it unique for its time. Such originality, however, pertains not only to the work's theory on causality and criticism of the medical use of "hypotheses"; it also contains (20.1) the earliest instance, to our knowledge, of the word *philosophia*.[23] The author's context is a criticism of Empedocles, whom he takes as the typical representative of the inquiry into nature with its theory of origins in terms of material elements. This is a very early doxographical allusion, which would anticipate the criticisms both of Plato and of Aristotle. Furthermore (though this cannot be discussed here), *Ancient medicine* gives a full idea of the historical development of medical knowledge, as achieved over time by proceeding from its own principles and following a particular method.[24] This outlook too is quite exceptional in the context of fifth-century thought (and not only there).

I do not intend, in making those observations, to reopen the debate on Diller's proposals about the dating of *Ancient medicine*, proposals he himself has now partially retracted. My purpose is simply to point out that this work constitutes a radical turn between the thinking of the fifth century and the philosophical elaboration of the fourth, both in the area of causality and on various epistemological issues.

In conclusion, my study has shown that it is not the case, as has been proposed, that the transition from the words *aitia/aitios* to the adjectival substantive *to aition* signifies a growth in conceptual generalization. This idea was probably suggested because of Stoic terminology, but in fact Thucydides, *Ancient medicine*, and Aristotle himself all use the substantive and the adjective without any difference of meaning.

There is a more important philosophical point. Aristotle did not completely follow *Ancient medicine's* rigorous definitions of causality.[25] His own definition of the "types of causality" in *Physics* II, in *Metaphysics* V, and elsewhere, looks back to the entire elaborations of the fifth century and makes from their uncertainties an element that is rich and conceptually complex. The answer to the question "why," in his view, should not be limited to giving the productive or efficient cause along the lines adopted by the theory of *Ancient medicine* and as the Stoics later thought.[26] His use of the idea of "end" or "goal" in causal explanation (as already in Plato's *Phaedo*) restores the moral and political context of "motives" and "reasons" that had been the property of fifth-century thought and that *Ancient medicine*, in its drastically rigorous way, seems to have dismissed as a piece of foolishness.[27]

NOTES

1 Lloyd [110] 49. He does, however (53–55), clearly state that the development of an "idea of causality" *as such* must be sought in the historians and doctors, and he also emphasizes the primary moral significance (tied to culpability) of words like *aitia/aitios*. See also Lloyd [108] 230ff., and

on the juridical origins of discussions of responsibility, G. E. R. Lloyd, *Adversaries and Authorities: Investigations into Ancient Greek and Chinese Science* (Cambridge/New York, 1996), 100ff.

2 Jaeger [102] vol.1, 393. Jaeger insists on the causal significance of *prophasis*, because he is naturally familiar with the moral/juridical sense of *aitia*, ibid. 161.

3 Williams [138] 58.

4 Frede [504] 132. His article is primarily concerned with the Stoic conception of causality.

5 Cf. DK 68 B222. DK 68 B118 (a late testimony of Dionysius, bishop of Alexandria, by Eusebius) contains the word *aitiologia*, but it is clear from the context that the passage is not a textual citation of Democritus: "Democritus himself, so people say, was in the habit of saying that he would rather discover a single causal explanation (*aitiologia*) than become king of the Persians." For a much more sanguine assessment of Democritus' interest in causality, see Taylor in this volume p. 187.

6 On this passage, cf. Said [519] 186 ff. For uses of *aitia/aitios* in Antiphon, cf. III.2.9; II.2.3, 6; II.4.10.

7 Adkins [82] 126. However, this work is fundamental for the matters discussed in this chapter.

8 Athenian law, starting from Draco's code, had introduced a radical distinction between voluntary and involuntary homicide, but morality on its religious basis of culpability and pollution continued to resist this. The definitive statement on this question was probably Aristotle's treatment of responsibility in *NE* III.1-7. For legal aspects of this in the fifth century, cf. Jones [103] and E. Cantarella, *Studi sull'omicidio in diritto greco e romano* (Milan, 1976).

9 See Irigoin [505] 173–80.

10 I follow the interpretation of K. Weidauer, *Thucydides und die Hippokratischen Schriften: der Einfluss der Medizin auf Zielsetzung und Darstellungsweise des Geschichtwerks* (Heidelberg, 1954) 8–20. See also Deichgraeber [500] 209–24, and Rawlings [518].

11 For other uses of *prophasis* meaning "grounds for accusation," "adduced reason," "pretext," cf. III.13, VI.105.2. That the word cannot mean "cause" is confirmed by Thucydides' analysis of the plague at Athens in II.49.2: "Those who did have any disease previously all caught the plague in the end. Others, however, were affected for no *prophasis*," that is, without any previous condition or clear reason to explain it. For an interesting parallel, cf. *Epidemics* III.3 where the author, just like Thucydides, writes that some were affected by the disease "in an explicable way (*meta prophasios*), but others not." On causality in the *Epidemics*, cf. Diller [502] and di Benedetto [499], esp. 317.

12 Cf. for example I.11.1, II.65.8, III.82.8.

13 It is probably close to the Anaxagorean group; see Vegetti [522].

14 Starting with Littré 1839 – vol.1, 453, the causal interpretation of the "sign" has become widespread; cf. especially Lonie [512] 79ff.; Perrilli [517]; Marzullo [514], a fundamental work. On the other side, cf. Vegetti [523] 76 ff.

15 The text of Jones (1923), *physin men echei kai prophasin*, justifies the translation "has a natural cause."

16 On the connection between *Airs, waters and places* and the *Phaedrus*, cf. Mansfeld [513]; and for the influence of the same Hippocratic work on the *Republic*, Vegetti [524].

17 For *metaitios*, with the sense of "complicitious," or "co-responsible," cf. Aeschylus, *Agamemnon* 811, *Libation Bearers* 100, *Eumenides* 199, 465, Euripides, *Suppliants* 26. For *synaitios*, in reference to double responsibility, human and divine, cf. *Agamemnon* 1116, and see Said [519] 177ff.

18 On the question of chronology, cf. Lloyd [154] 49–69.

19 The word *tauta* is interpreted abstractly and generally by the majority of translators (Jones, Festugière, Eggers Lan, Lara Nava, Vegetti.) But, Jouanna [506] 201 n. 144, following Müri [515], takes it to refer to the preceding words, "these humours." That interpretation is invalidated by what follows where not only the humours but also hot and cold are the causes of other diseases. *Tauta*, then, includes both humours, temperature states, and eventually every cause of disease. The importance of the passage, with its anticipation of Bacon and Mill, is signalled by Lloyd [110] 54 n. 232.

20 With regard to Plato, cf. *Phaedo* 96a9-10, "I thought it wonderful to know the causes of each thing, why it comes to be and why it passes away and why it exists," with *Ancient medicine* 20.2, where medicine is assigned the task of discovering "what man is and by what causes he comes to be." Compare also *Phaedo* 96c7-8 ("Why does a man grow... through eating and drinking") with *Ancient medicine* 20.3 ("what man is in relation to what he eats and drinks"). The context of these passages in Plato is analysis of the true forms of causality in polemic with Anaxagoras.

21 The hypothesis has been formulated by Diller [501], though he does not make any mention of the work's conception of cause, and rather insists on its attack on the method of hypothesis that is treated in the *Phaedo*. Diller's suggestion has not found favour, and he has partly retracted it, cf. Diller [503], where he regards *Ancient medicine* as a work composed in the transition from sophistic thought to Athenian philosophy, and says: "In *Ancient medicine*... medicine appears to be grounded on the understanding of causal connection" (92-93). Neither Longrigg [510] nor

Nickel [516] offers anything significantly novel on the issue, though they both study *Ancient medicine* in connection with pre-Platonic thought.

22 Cf. *Phaedrus* 270c: "Consider, then, what Hippocrates and true discourse say about nature," and for discussion of this passage, see Vegetti [522] 97 ff., and Mansfeld [513].

23 This has not traditionally been accepted as the first occurrence of *philosophia* because of the belief that the word was of Pythagorean origin, but that idea is contested on good grounds by Burkert [205].

24 Cf. sect. 2: "Medicine has long had all its means to hand, and has discovered both a principle and a method, through which the discoveries made during a long period are many and excellent, while full discovery will be made, if the inquirer be competent, conduct his researches with knowledge of the discoveries already made, and make them his starting point." (tr. Jones)

25 On causality in Aristotle, see Sorabji [520].

26 For the Stoic tendency to reduce causality to a single "efficient" form, see Frede [504] and also J. J. Duhot, *La conception stoicienne de la causalité* (Paris, 1988) and A. Ioppolo, "Il concetto di causa nella filosofia ellenistica e romana," *ANRW* (1994) 4493–4545.

27 This chapter has been translated by the editor from the author's original Italian text.

PAUL WOODRUFF

14 Rhetoric and relativism: Protagoras and Gorgias

Protagoras and Gorgias are the most significant of the early sophists. Although philosophy as we understand it was not their chief business, they taught views and methods of argument that have fascinated subsequent philosophers. In their own context they exhibit the spirit of the new learning, the cultural and intellectual revolution of the fifth century B.C. in Greece. This revolution – or, rather, the reaction against it – is illustrated in Aristophanes' comic play, *The Clouds*, by a character enrolling in a sophistic school in order to learn the "unjust argument." This, he has heard, can win a jury's favour for the worst of offenders. The syllabus, he finds, involves science as well as rhetoric, both laughable in this satire. What is not laughable is the popular animosity against the school that leads to its incineration (at least one student included), a grim sign of the strong feelings that would later contribute to the death of the man whose name Aristophanes uses for the leader of his imaginary school – Socrates.

Sophists

Socrates, as Plato takes pains to show us, would have had no place in such a school, for he did not pursue forensic rhetoric or natural science, did not teach anything for a fee, and did not travel. The sophists, by contrast, travelled among Greek cities, taught adult or young adult students, and received substantial fees, especially for dispensing the power of words. The word *sophistês* in its earliest uses referred to wise men such as poets, and it still occurred in the fourth century B.C. as a general term for philosophers and orators. Under Plato's influence, however, the word came to have its narrower scope and its special association with rhetoric and relativism. This is misleading, for among the subjects taught by sophists were oratory, ethics, political theory, law, history, mnemonics, literature, mathematics, and astronomy. Some sophists dealt also with metaphysics and epistemology. Others pursued an anthropological interest in the origins of human culture, which (in contrast to earlier mythologies) they attributed to human invention. The sophists' message that progress came through technological and political developments advanced their frankly self-serving claim that education was among the greatest public goods.

Little has survived from the many books and speeches produced by sophists. On points of doctrine we are often left to draw speculative conclusions from slender evidence. Much of what we believe about the sophists is derived from Plato, who is critical of most of them for presenting themselves as teachers of subjects he did not think they properly understood. Plato's work is historical fiction written fifty or more years after Protagoras made shock waves in Athens; his aim is philosophical rather than historical, and we must be careful not to be seduced by his vivid writing into taking it for an eyewitness account.

Part of Plato's aim is evidently to distinguish Socrates from the sophists with whom he was associated in the popular imagination, and this aim helps to explain why Plato shows Socrates challenging various sophists to defend their claims as teachers, while vigorously denying for his part that he is a teacher at all. Although Plato treats Protagoras and Gorgias with respect, he has Socrates easily refute them, and he is harsh when he writes of sophists in general. In his view, sophists substitute appearance for reality and persuasion for truth; they use fallacies deliberately to mislead a dazzled audience; and they claim the ability to vanquish anyone by the power of rhetoric on subjects of which they – the sophists – are completely ignorant.

Plato's portrayal of sophists has given us the term "sophistical" for devious argumentation. Following leads in Hegel, the nineteenth-century scholar George Grote gave a powerful defence of the sophists in his *History of Greece*, and most recent scholars of the new learning have attempted to separate their subject from the negative image it used to carry. The place of sophists in the history of Greek philosophy is now widely recognized.

The first and most successful self-proclaimed sophist was Protagoras. His profession, as he defined it, was to improve his students by imparting to them the virtue of good judgment (*euboulia*), which, he said, would make them highly capable or powerful in public life, as well as in managing their own households (Plato, *Prot.* 318e). He had broad interests in the use of language, especially for oratory. In the history of philosophy, he is best known for his teaching that "a human-being is measure of all things" (DK 80 B1), which in Plato's interpretation is equivalent to the relativism of truth to individual perception and judgment. Only a handful of sentences have come down to us from Protagoras, along with a few words, titles, or catch phrases, so that the task of reconstructing his thinking on such points is largely speculative.

For Gorgias we have two complete speeches, a substantial fragment of a third, and two different summaries of a major philosophical text – still a tiny percentage of his output during a long and productive life. Roughly contemporary with Protagoras, he was a teacher of public speaking and according to Plato made no claim to improve his students in other ways. Why should he, when he believed in the overwhelming power of speech? He carried his method of argument from the public stage of oratory to the treatment of deep philosophical issues. While Protagoras relativized reality and affirmed individual knowledge, Gorgias denied reality and knowledge altogether. Both paradoxical doctrines are probably responses to developments in earlier philosophy, and both provoked responses from later philosophers.

Protagoras' success as a teacher and Gorgias' fame as a speaker paved the way for the next generation of sophists. Prodicus was known for attempting precise distinctions in the definitions of words. Hippias had the widest range of interests; he is said to have made an advance in science (the invention of the curve known as quadratrix) and also was known for his work in astronomy. We have evidence bearing on the teachings also of Antiphon, Critias, Evenus, Euthydemus, Thrasymachus, Alcidamas, and Lycophron. The *Anonymus Iamblichi* (an unknown writer quoted by Iamblichus) and the author of *Dissoi logoi* (*Twofold arguments*) are also considered sophists. Views related to those of the sophists appear in Plato's *Republic* 358e-359b (on the social contract) and *Gorgias* 483a-484c (on the conflict between law and nature). The influence of sophists is also evident through Thucydides' *History of the Peloponnesian War*, in his mastery of rhetoric, his realism about human motivation, and his reticence about religion and the gods.

Socrates appears as the teacher in Aristophanes' *Clouds* (surviving version, 420 B.C.), giving lessons in natural science and the sort of public speaking taught by the sophists. Although false on most details, Aristophanes' portrayal of Socrates must be true enough to have amused an audience who knew Socrates' reputation. Aside from Antiphon and Thucydides, Socrates is the only prominent Athenian figure who engaged in the new learning, and his work has much in common with that of the sophists. He shared the sophists' interests in ethics and adopted some of their ideas and methods. His theory of punishment as educational is close to what Plato attributes to Protagoras (*Prot.* 324b), and his method of questioning is a variation on a sophistic practice. His interest in defining concepts such as justice is related to sophists' work on the correctness of words.

RHETORIC

Persuasion, says Gorgias, "has the same power, but not the same form, as compulsion," and it has this power in virtue of the acquired skill (*technê*) of the speaker, whether or not what it says is true (*Helen* 13).[1] He rests this claim on three examples: speculative astronomers are persuasive on unseen subjects by mere opinion; philosophers triumph by the quickness of their thought; and speakers in law courts win by virtue of the skill with which their speeches are written, rather than by virtue of being right.

That skill with words could trump the truth in a court of law does not in itself imply a sceptical or relativistic philosophy. The view could be held equally by one who respects the truth (as Gorgias claims he does in the *Helen*) or by one who rejects the possibility of speaking the truth altogether (as Gorgias appears to do in his *On not being*). Even Plato agrees to the power of speeches presented to large groups; that is why he presents Socrates at work in contexts in which truth has a better chance of being persuasive than it does in a court of law. Athenian courts consisted of panels of jurors too large to bribe, but who easily could be swayed by rhetoric. Socrates appeals, by contrast, to the deepest held convictions of his interlocutor alone, and to these convictions it is truth, not the skill of either party, that should matter.

The first known teachers of the art of words were Corax and Tisias in Sicily. They are usually not listed as sophists, however. The first such teacher to be called a sophist was Gorgias, who took Athens by storm on his visit from Leontini in 427 B.C. and who was the major influence on the next generation of orators. His was evidently the most popular subject offered by sophists. The advent of democracy in Athens and Sicily during the fifth century had given new powers to strong speakers in law courts and assemblies, but the art of words was not a recent invention. Greeks had been fascinated by displays of public speaking as early as Homer and had always honoured those who succeeded in contests of speeches. Statesmen such as Themistocles owed their success to oratory long before sophists came on the scene, and set speeches were a feature of the earliest Greek plays. In all Greek cities, but especially in democracies, fine oratory had an important place in entertainment, in deliberative bodies, and in law courts. Athens offered any adult male citizen the right to speak in assembly, and this gave unelected busybodies, known as demagogues, an opportunity to influence policy through public speaking alone. Meanwhile, democratic courts could ruin or save a man, depending (it appeared) on whether plaintiff or defender gave the better speech, but rhetoric did not always triumph in politics or provide security in law courts. Pericles, the best speaker of his day, was unsuccessful in his own legal defence, and Antiphon's defence speech, though a success among intellectuals, did not save him from execution.

The tradition in philosophy of construing rhetoric as merely the art of persuasion is largely due to Plato, who represents Gorgias teaching rhetoric as an art of persuasion that is neutral regarding subject matter, can be mastered by itself, and is powerful enough to trump experts in any other field, even on the subjects of their expertise. Thinkers before Plato probably did not consciously employ so narrow a concept of rhetoric; Plato's account is tendentious, and most early teachers of public speaking went beyond the subject-neutral art of persuasion.[2] We know that under the art of words sophists covered such topics as characteristics of speech acts (Aristotle, *Poetics* 19 1456b15), correct use of words, and methods of argument. The latter were designed not merely for persuasive purposes, but for use in serious inquiries of all kinds, from metaphysics to anthropology.

Noticing that such methods cannot establish knowledge, Plato wrongly infers that they have no value but to persuade.

"Correctness of words"

This was the title for teachings by a number of sophists, but only in a few cases do we know what it meant. Protagoras argued that "wrath" in the first line of the *Iliad* (a feminine noun in conventional Greek) should properly have been treated as masculine in gender. He also sought to correct poets who appeared to contradict themselves in their verses.[3] Prodicus argued for the precise use of words, making careful distinctions between such pairs as "pleasure" and "enjoyment."[4] Both evidently sought greater precision with words than conventional usage allowed. Gorgias too appeals to correctness of words (DK 82 B6), but his art laces public speeches with euphemism and metaphor (B5a, 15, and 16). The philosophical views of known sophists do not readily allow for a fixed standard of correctness; and some scholars have supposed that by "correctness" they meant an effective use of language,[5] which would be compatible with relativism in that the same language affects different people differently. But there is no doubt that Protagoras' standard was independent of public opinion, because it promoted natural over conventional genders for words.

Opposed speeches

The art of presenting opposed speeches – of giving arguments on both sides of an issue – was taught by Protagoras and other sophists (D.L. IX.51). Protagoras' works are lost, but we have surviving examples in the *Tetralogies* of Antiphon and the *Dissoi logoi*, as well as in the *History* of Thucydides and the plays of Euripides and Aristophanes. This art is related to "making the weaker argument stronger,"[6] which, given the ambiguity of the Greek words, meant also "making the wrong argument right." Gorgias' surviving display speeches illustrate how clever argument can strengthen a weak case. This practice was held against many sophists and was part of the unspoken charge against Socrates (Plato *Apol.* 18b). Opposing arguments, like arguments in defence of a weak case, typically make use of the concept of *eikos*, which involves a kind of relativity.

Eikos and *euboulia*

Appeal to reasonable expectation (*eikos*, likely or probable) is the most common argument scheme taught by sophists. It was used widely in forensic and deliberative speeches, and it also had a useful function in what we today would call social science. Good examples are to be found in Gorgias' surviving speeches and in the *Defence* and *Tetralogies* of Antiphon. A rich man accused of stealing a cloak, for example, could appeal to the expectation that a rich man would not bother to steal a cloak, having no need to expose himself to the risk of doing so when he could buy one. Antiphon was charged with being a leader of the oligarchic coup of 411 B.C.; the surviving fragment of his defence speech depends entirely on *eikos*, arguing that the expected motives for upsetting a government do not obtain in his case: it would not have been *eikos* for an orator to desire oligarchy, since there is a smaller market for speeches in that form of government.

Such appeals, frequently couched as rhetorical questions, are fundamental to the larger argumentative structures developed by sophists – opposed speeches (for which Protagoras was notorious) and exhaustive hierarchies of argument (developed by Gorgias). *Eikos* serves when eyewitness testimony is lacking, as it does for Thucydides in his reconstruction of early Greek history, guiding his extrapolations from the slender evidence available to him. The speakers in Thucydides frequently appeal to *eikos* to guide their predictions of the future, both in debate about strategy and in exhortation to battle.[7]

Plato wrongly treats *eikos* as a value offered by sophists in place of truth (*Phaedrus* 267a); in actual usage, *eikos* is an admittedly risky method for exploring truth when the available evidence will not support ascertainable conclusions. As such, the concept of *eikos* depends on that of truth; what is *eikos*, says Aristotle, is what obtains "for the most part," and the more often we find a generalization to be so, the more *eikos* it is (*Rhet.* II.25.8-11). This is not quite right, however, for the sorts of issues treated by sophists. What typically threatens a judgment based on *eikos* is not a lack of instances for its general rule (which obviously holds for normal cases), but rather information that would exclude the case at hand from falling under the rule. If, for example, all we know is that the accused was rich and the theft was only a cloak, we would not reasonably expect the accused to have been the thief; but the addition of certain details (the coldness of the night, the absence of witnesses, the ruthlessness of the accused who happened to be outside without his cloak) makes the accusation more reasonable. Opposed speeches in the sophists and Thucydides show that these thinkers were well aware that differences in background information generate differences in *eikos*, which is therefore relative to background information. Change the background of a given case, and you change what it will be reasonable to believe about it. When little is known of the facts, opposing orators can adduce considerations in view of which contrary conclusions seem equally reasonable, as occurs in Antiphon's first tetralogy: The plaintiff argues that the wealthy defendant was likely to have done the crime in order to protect his riches from the man he is accused of killing; the defendant counters that committing the crime would have put his wealth at even greater risk, and that therefore he was unlikely to have done so. The plaintiff in this case calls attention to a fact that the defendant plays down: that the defendant was at risk of a lawsuit from the victim. This fact defeats the normal expectation that wealthy men do not need to resort to crime.

Such appeals to normal expectation are what modern logicians call *defeasible*; they hold only for normal conditions and are defeated by unexpected abnormalities. Good use of such reasoning depends on a clear sense of what is normal for a given generalization, as well as on knowing what questions might lead to its defeat. Defeasible reasoning is often the best we can do (as in the case of most medical diagnosis). Its disadvantage, however, is that it depends heavily on the good judgment and experience of those who use it, who must be able to ask appropriate questions and identify relevant answers. All judgments of *eikos* are relative to selected background information. Aristotle overlooks this and wrongly supposes that an outcome could be *eikos* without qualification. In Aristotle's view, when opposed outcomes seem equally *eikos*, only one of them would actually be so without qualification (*Rhet.* II.24). But if we could judge the outcome without qualification, we would have no need for *eikos* in the first place. Aristotle would have been right to say that only one of them could be true, but that is another matter. It is important to contrast *eikos* judgments against the probabilistic results found in modern science. Probabilities are based on inductions from cited observations and are not relative to subjective information, but for *eikos* the issue is not whether the generalization on which it depends is true – all parties agree to that – but whether the case falls under it. The virtue of good *eikos* judgment is not its empirical foundation, but the relevance of the information that frames it.

Aristotle says in the passage cited that Protagoras' use of such reasoning incurred public wrath because it seemed to make the weaker argument stronger. Such a method aroused the fear that a good speaker could successfully defend a criminal or convict an innocent man. If there is no witness to settle the matter, and judgment cannot decide which piece of information is the more relevant to the case, a contest of speeches appealing to *eikos* can be merely a contest between the persuasive powers of the two speakers. In such a case one speaker can argue as well on one side of an issue as he can on the other, if he is trained to do so.

To Plato, the possibility of equally credible arguments on both sides is fatal to the moral integrity of forensic oratory; serious people should concern themselves instead with otherworldly matters. But to those whose concerns are practical politics and law, such as Protagoras, the danger of reasoning by *eikos* would point to the enormous importance of *euboulia* (good judgment) – a virtue respected among Greeks other than Plato. Good judgment makes the all-important difference between tricky rhetoric and a serious inquiry into the human arena where firm knowledge is impossible.

Gorgias' rhetoric

This calls for special treatment, not only because Gorgias is the foremost early Greek orator but also because two complete speeches of his have survived, *Encomium of Helen* and *Defence of Palamedes* (DK 82 B11), as well as a substantial fragment of a third, *Funeral oration* (B6). All are designed to display the art of public speech by using devices that could be easily transferred to other speeches. In style, organization, and argument they represent patterns that appear in later oratory as a result of Gorgias' wide influence as a teacher. His *Funeral oration* echoes in many speeches, from Pericles' to Lincoln's, and his *Defence of Palamedes* is imitated in organization and argument by no less a figure than Plato in his *Defence of Socrates* (usually known as the *Apology*). Elements of Gorgias' style appear in a number of other Platonic speeches, especially the Encomium of Love by Agathon in the *Symposium*. In real life Gorgias' teaching was evidently a major influence on Hippias and, later, on Plato's contemporary Isocrates.

Gorgias' style brought to prose some of the power he associates with poetry to move the feelings of an audience (*Helen* 9). Rhythm, balance, and internal rhyme are contrived to make passages memorable (as in poetry), and thoughts are expressed through language that is ornamented with metaphor (B5a) and compound expressions (B15). Balance and rhyme are achieved together through the aid of antithesis, only partly captured by the English: "If she was by force abducted and lawlessly forced and unjustly violated, clearly he who abducted was unjust in violating, and she who was abducted was unfortunate in being violated" (*Helen* 7). We are told that Gorgias' art of words depends on the concept of *kairos* – saying the appropriate thing at the right time – but we do not know exactly what he meant by this (B13), and, in the surviving speeches, Gorgias does not select just the right argument for the moment but piles argument on argument in an attempt to make the audience think he has covered every possibility.

The *Defence of Palamedes* is probably meant as a paradigm defendant's speech for a court of law, although the case is drawn from myths passed down about the Trojan War. A Greek hero famous for his inventiveness, Palamedes has been accused by Odysseus of having accepted a bribe from the Trojans to betray the Greeks. The matter must rest on *eikos* because there is no evidence. (In the fourth century B.C., however, Alcidamas wrote a prosecution speech for the case, evidently as a response to Gorgias, in which Odysseus appeals to evidence no longer available – an arrow that concealed a message from a Trojan to Palamedes.) Gorgias' defence follows a path familiar to readers of Plato's *Apology*, from the opening disclaimer of rhetorical art (4) to the closing appeal and warning to the judges (33–35). The arguments within the speech are organized in a way that is Gorgias' trademark: every possibility is considered, even those that could only follow ones he has rejected. How, for example, could Palamedes have met secretly and privately with the Trojans when they have no common language? But suppose they had met, how would they have exchanged pledges in secret? And so he proceeds down a long list of rhetorical questions linked by "grant that this happened, even though it did not, how could the next have occurred?"[8]

The *Encomium of Helen* argues that Helen is not to blame for the Trojan War; it is not her fault that she was taken from her husband to Troy. This speech also depends on *eikos*. Only four possible explanations for Helen's journey to Troy are reasonable, says Gorgias: the gods planned it; she was physically forced to go; she was compelled by the power of a speech; or she was affected by love. Gorgias shows, exhaustively again, that on each of the possibilities Helen is not to blame. His argument in the case of speech celebrates the power of language to affect the mind by comparing it to the power of a drug to affect the body (*Helen* 14). We also find a tribute to the deceptive power of language in a surviving sentence about theatre: "Tragedy produces a deception in which the one who deceives is more just than the one who does not, and the one who is deceived is wiser than the one who is not" (B23). But in his essay *On not being*, Gorgias appears to assert that we cannot communicate at all by means of language, and this creates a problem to which we shall return. The last words of the *Helen* tell us that the speech has been written for the author's amusement, and we cannot be certain how seriously Gorgias intended such arguments as he gives there. Playfulness abounds in early Greek oratory. The use of absurd fallacies, such as the ones that made Euthydemus famous, is more suited to dazzle an audience than to hoodwink or persuade it against its will. On the whole, however, the art of words was intended for serious purposes and commanded serious fees.

RELATIVISM

Relativism, broadly defined, is any view that allows apparently conflicting judgments to be equal in some respect for the people who believe them – equally arbitrary, equally reasonable, equally useful, or equally true. Extreme relativism is any view that denies the possibility of absolute truth by insisting that nothing could be true without relativistic qualification; its moral correlate insists that nothing could be good without qualification. Extreme relativism interests philosophers because it makes contradiction (or contradiction on moral topics) impossible, but it cannot be attributed to any of the sophists, with the possible exception of Protagoras.[9]

Early Greek travellers readily came to the idea that the different moral traditions they discovered were *equally arbitrary*, since they rested only on custom. The power of custom (*nomos*) was recognized before the sophists and celebrated in the often-quoted line of Pindar, "*Nomos* is king" (to be found, for example, at Plato's *Gorgias* 484b). Herodotus observes how customary notions of right and wrong vary across cultural boundaries (III.38), and, as travelling teachers, some sophists developed an interest in comparing ethical, political, and religious ideas in various cultures. Research of this kind tends to make traditional values seem arbitrary, and defenders even of newly spawned traditions had reason to feel threatened by the new learning in the later fifth century, because it appealed to the conservatives who were critical of the new customs of democratic Athens. Such research might have led to extreme relativism had it not involved a commitment to natural values, such as the passion for nature that guides Callicles in his radical attack on custom (Plato *Gorg.* 483a-484c).

We have already seen how opposing views can be made *equally reasonable* through the selection of different information as relevant by different orators for judgments of *eikos*. Though disturbing, this result does not entail extreme relativism: contrary views may be equally reasonable in a world of unqualified truths, just as it may be equally probable for a coin to fall heads or tails. Moreover, extreme relativism would wipe out *eikos* by rejecting unqualified truth, which is its conceptual parent.

Conflicting views may be *equally useful*, depending on circumstances. Like Heraclitus, Protagoras probably held that the same thing could be good for one species and bad for another (Plato, *Prot.* 334a-c, cf. DK22 B61). On this view, conflicting opinions about the healthfulness of a certain oil would be equally useful, depending on whether the oil was to be taken internally or externally. Such relativism may have furthered in some minds the independent idea that there is no such thing as an absolute good or an absolute evil, but it does not in itself entail extreme relativism.

Equality in point of *truth* is a more radical claim, and this, probably, is Protagoras' teaching: "A human being is the measure of all things, of those things that are that they are, and of those things that are not that they are not" (DK 80 B1). According to Plato, this sentence (probably from a book called *Truth*) implies that my judgments are true for me at any time, and yours for you (*Tht.* 152a). In its initial context this seems to apply only to perception, but Plato extends it to opinion in general. On Plato's understanding, Protagoras means to claim that no opinion is ever false, and that every opinion is true for the person whose opinion it is. Relativism regarding truth implies that conflicting views are equally true. This raises a problem in logic. If the conflicting views are contrary, they cannot both be true; that is what contrary means. If they are not contrary, then in what sense do they conflict? It cannot be a truth-functional conflict if there is no common truth, and it cannot be a conflict over action if there is no common reality in which to act.

Protagoras and truth

Ancient philosophers recognized the difficulty in Protagoras' relativism regarding truth. Four solutions were considered in ancient times, none entirely satisfactory. We cannot be sure which of these, if any, would sit well with Protagoras. We must keep in mind that the human-measure sentence comes to us without a context that would enable us to reach a definite interpretation. As to whether "human being" refers to an individual or to the species, scholars generally follow Plato's individualist reading, but with caution. Plato's testimony is not authoritative, since it is woven into a dialogue that carries on Plato's own philosophical work. The evidence of later writers, such as Aristotle and, much later, Sextus Empiricus, is derived from Academic sources that are themselves contaminated by Plato.[10] What follows is a summary of the principal attempts to reconstruct Protagoras' teaching.

First, Aristotle thought Protagoras meant to dispense with the law of noncontradiction altogether, and to insist that conflicting opinions are simply true, even if they are contradictory. He says Protagoras' human-measure follows from, and entails, the position that the same judgment may be true and false at the same time (*Metaph.* IV.5 1009a6-15 and IV.4 1007b18-25). But the cost of giving up that law is high, and Protagoras seems to have invoked the law in other contexts: *Protagoras* 339b9 shows that Plato thought Protagoras objected to contradictions in poetry, and Plato's own attempts to solve the problem do not dispense with the law.

Second, a solution implied by Plato's *Theaetetus* (without his infusion of Heracliteanism): If "the wind is warm" and "the wind is cold" are contrary without qualification, they are opposed enough to be conflicting; if each is true under a qualification ("for me," "for you") then they are equal enough in respect of truth, although neither is simply true, and the qualifiers ("to me" and "to you") eliminate real conflict. If this is Protagoras' solution, he must deny that one speaker can really contradict another, and this too is attested (Plato, *Euthydemus* 286ab, D.L. IX.53.). Each opposed speaker would be reporting on a private truth; and there would be no conflict between them. This too carries a high cost: it is hard to understand what could be meant by private truths, especially since scholars agree that Protagoras could not have been an idealist and did not mean that the content of my mind simply constitutes my private truth.[11] It is hard anyway to dispense with the idea – fundamental to Protagoras' teaching – that speakers can take contrary positions. But Plato's solution rules out even practical (as opposed to logical) conflict. For example, you, finding the wind cold, may wish for shelter from it, while I, finding it warm, may wish to stay out in it; but we are not speaking of the same wind, so there is no conflict.

Third is the Heraclitean interpretation also given in the *Theaetetus*. There, the Platonic Socrates attributes to Protagoras, as to Heraclitus, the idea that opposites are always shifting into and out of the things we perceive (and everything else is changing as well). This he calls the "secret teaching" of Protagoras, implying that he had no evidence for this interpretation, either from the written record or from oral reports. We must suppose this is entirely Plato's contribution and has no direct relevance to Protagoras, except that we need to explain why Plato thought the hypothesis of change explained the human-measure. His solution to the problem of contradiction is this: what I perceive obtains only at the moment at which I perceive it, and similarly for you (on the assumptions that no two of us perceive the same object at the same moment, and we each change the object by perceiving it). Plato insists that in this view "is" would have to be replaced everywhere by "becomes"; but if "is" drops out of the picture, so too must truth and knowledge as Plato understands them. Nevertheless, each person's changing perceptions infallibly correspond to the changing objects with which he or she is in perceptual contact, so that something like relativity of truth would be preserved in the secret doctrine.

The fourth solution is the most benign. Suppose there is one truth for all of us, but that it is complex enough to support our different views of it. Things might be constituted out of the opposites, for example, as early Greek philosophers believed; and if there is both hot and cold in the wind, then I might feel more of the hot (owing to some peculiar feature of my perceptual apparatus) while you feel more of the cold, but each of us feels something that is truly in the wind. The wind really is both hot and cold, and this is logically possible if opposites can be copresent, as sweet and sour can be stirred into the same soup. This leaves logic intact, but in what sense does it allow our views to conflict? They conflict in that they single out polar opposites from among the wind's qualities; they might also conflict if they recommend opposite courses of action (go indoors, stay outside), since it is the same wind for both of us. The only ancient authority for this fourth view is Sextus Empiricus in *Outlines of Pyrrhonism* I.216, but his account may be derived from a misreading of Plato's *Theaetetus*, which in itself requires either the second sort of interpretation or the third.[12] The case for the fourth reading must rest on *eikos*: it is the most reasonable in view of what we know of Protagoras and his time.[13] On this reading, Protagoras does not deny absolute truth and is not an extreme relativist. That is a happy result, because extreme relativism is incompatible with a number of claims made by Protagoras and other sophists.

Nature and the new learning

"Whatever we see has a nature (*physis*)," says Gorgias, "not the nature we wish, but the one each thing turns out to have" (*Helen* 15). Appeals to nature or to the natures of things are endemic to the new learning and rule out extreme relativism or scepticism. Nature is independent of what anyone thinks it to be, so if a thinker wishes to attack popular or conventional views, what is more appropriate or natural than to appeal to nature itself as a witness against tradition? Nature lies behind knowledge in the way convention (*nomos*) lies behind opinion, and the appeal to nature typically tries to pit the knowledge of the appellant against common opinion. Since nature is the same for all, the appeal to nature defies relativism; and since the appeal presupposes knowledge, it excludes scepticism.

Hippias, according to Plato, appeals to *physis* to defend his view of the natural kinship of humankind (or at least of the wise), who are divided by the mere conventions of national difference (*Prot.* 337d-338b). Plato's Callicles attacks conventional justice on the ground that it tries to block the law of nature that the strong should be free to satisfy their greatest desires (*Gorg.* 482c ff.). Gorgias is too playful for us to be sure he believes what he says on behalf of nature in the *Helen*, but the case is clear for Protagoras' standard for "correctness of words." This he applies against the conventions of language as if it were an appeal to nature – to natural gender, for example.[14] Moreover, Plato shows Protagoras defending justice as universal to human societies by putting it among the necessities of human life. Although acquired by learning, justice is nevertheless parallel to the natural abilities of animals to survive (*Prot.* 322). As a necessary tool of survival, justice cannot be whatever a group might say it is; it could not, for example, be the law of tooth and fang (which would not support survival), and there must be natural limits on what it could be. An adequate account of Protagoras' relativism must be tempered by a recognition of this tendency towards naturalism. The combination is not as odd as it may seem: Nietzsche combines his well-known perspectival relativism with psychological naturalism. For both the ancient and the modern relativist, however, naturalism is rooted not in metaphysics, but in human experience.[15] Generally, the new learning's attack on tradition was founded not on relativism but on views about the fixed natures of things. The traditional views that sophists are relativists[16] must give way to the recognition that what most characterizes the sophists as a group is their commitment to human nature as a subject of study. We must also give up the idea that sophists are sceptics.

Gorgias and scepticism

Gorgias' three theses in *On not being* are, for anything you might mention: (1) that it is nothing; (2) that, even if it were something, it would be unknowable; and (3) that, even if it were knowable, it could not be made evident to others.[17] This is neither scepticism nor relativism: it is not scepticism, because a true sceptic (in the ancient sense) holds back from all beliefs, even from negative ones such as the ones for which Gorgias argues here; it is not relativism, because Gorgias' claims are global and negative ("it is unknowable to all of us"), whereas a relativist such as Protagoras makes claims that are positive and local ("my views are true for me"). It is not extreme relativism because that makes outright falsehood impossible and therefore eliminates contradiction and refutation;

but Gorgias consistently allows that some positions are true, others false.[18]

Gorgias develops his argument here dialectically, using argument forms borrowed from the dogmatic philosophers to whom he is opposed – mainly Zeno and Melissus. The work is a serious attempt to refute theirs and Parmenides' views on being. The thesis is simply negative, so we cannot be sure what, if anything, Gorgias would have put in the place of the views he refutes.[19] It seems most likely that he had no philosophical theory to propose at all – no alternative account of being, knowledge, or meaning – just the practice itself which he taught, of influencing human affairs through the effective use of words. In a modern context, he would perhaps call himself a behaviourist and a pragmatist.

Although scepticism and relativism are strictly speaking opposed, they nevertheless have certain affinities. Relativity became one of the principal tropes of sceptical argument in later antiquity, and ancient sources identify Aenesidemus – the thinker who probably revived Pyrrhonism in the first century B.C. – as a relativist. Although one of Sextus' sources makes Protagoras a positive dogmatist (*PH* I.216), another lists him among thinkers who abolish the criterion by appeal to relativism (*M*.VII.60). The road goes both ways, however: scepticism about the imperceptible leads to relativism.

Scepticism about the imperceptible

"Concerning the gods," Protagoras wrote, "I am not in a position to know either that they exist or that they do not, nor can I know what they look like, for many things prevent my knowing – the subject is obscure (*adêlon*), and human life is short" (DK 80 B4). Protagoras probably means that we do not have any clear sightings of the gods, as we might if we had lived long enough to have been witnesses of events in which the gods are said to have intervened. On this as on other subjects, Protagoras eschews speculation outside the human sphere.[20]

Generally, Protagoras limits what we know to what we perceive, the rest being *adêlon*. Some evidence suggests that Protagoras holds that what is perceived at a given time is all that is really there.[21] A strong empiricism of this kind leads to relativism regarding truth (with problems to be discussed in the following sections), since different people may perceive different things in similar circumstances. It is for such reasons that Democritus rejects perception as a source of knowledge for the way things are, and we can be fairly sure that Protagoras would abstain from talk about entities as obscure as Democritean atoms. Protagoras and Democritus came from the same city and were roughly contemporary (there was debate even in ancient times as to which was the elder). We have evidence that they disagree, in a way confusing to their ancient followers, as to the import of perceptual relativism. Democritus quarrels with Protagoras' view that "each thing is no more (*ou mallon*) such than such," though he says something similar himself. Presumably they would agree on the relativity of perceptible qualities but vigorously disagree about whether there are fixed structures beneath the level of perception (DK 68 B156.14). Even Plato will agree to the relativity of what is perceived; that is why he turns to the unperceived. Protagoras, however, turns away from the unperceived and so forces himself into some form of relativism.

Teaching without knowledge

Plato thinks most sophists value persuasion over truth. He blames them for presenting themselves as moral teachers when their knowledge amounts (in his view) to little more than an ability to mimic experts. Plato's standards are too high to be met by any normal human (as he himself would admit), but we cannot save Protagoras and Gorgias from this charge simply by applying a gentler standard, since we have reason to believe that both of them taught views that would make it impossible to satisfy any reasonable standard of knowledge. How can Protagoras teach if relativism means he knows no more than his pupils? How can Gorgias teach if he is right in *On not being*? If they are coherent in thought and practice, then they must believe they could be teachers without having knowledge.

A Gorgian answer

Gorgias claims to teach only rhetoric, and if Plato is right about this, Gorgias teaches the art of speaking in total abstraction from any subject matter. *On not being* raises difficulties for knowing or communicating the way things are, but it implies nothing directly about the mastery and transmission of skills. So, for example, if Gorgias taught carpentry, and we agreed he could do this without pretending to know or say what wood or furniture actually is, he would be safe from his own arguments (if not from Socrates'). But Gorgias teaches rhetoric, and that is uniquely vulnerable. The third argument of *On not being* concludes: "If anything is knowable, no one could make it evident to another both because things are not words and because no one has the same thing in mind as another."[22]

If the aim of rhetoric were to put what the speaker wants into the minds of an audience, effective rhetoric would be impossible on this argument. Yet Gorgias teaches rhetoric. Perhaps he takes a different view of this, one by which an orator would succeed if he gets the votes he wants, regardless of what occurs to the minds of his audience – if, that is, his aim is purely behavioural. If so, Gorgias' argument is not against the power of words but against understanding their meanings as referential or ideational, and his argument does not threaten his career. The aim of rhetoric would be to influence action, nothing more.[23]

A Protagorean answer

Protagoras' human-measure implies that, since my judgments would be true for me and yours for you, neither of us would have anything to gain from a teacher – not, at least, in point of truth (Plato *Tht.* 161c-162c). Everyone would have from private resources such knowledge as is possible for anyone to have, and no one could know more than another on any subject.

If the aim of teaching were the transmission of knowledge, then teaching would be impossible in Protagoras' view. Yet Protagoras teaches. Perhaps this is because he would separate teaching from knowledge altogether. The main subject he claims to teach is good judgment in practical affairs, *euboulia*, along with the ability to speak on either side of an issue – an ability Aristotle connects with the use of *eikos* (*Rhet.* II.24). Good judgment in the area of reasonable expectation depends not on knowing more of the truth than others do, but on having the good sense to ask pertinent questions and to recognize what information is most relevant. *Eikos* is conceptually parasitic on truth, but the route to *eikos* (unlike the route to truth) does not require special knowledge of the matter at hand, since all parties to a dispute about *eikos* start with the same information. Therefore, in order for Protagoras to be a teacher, he does not need more information or better grounded information than what his pupils have. He can instead teach from only this advantage – good judgment.

Gorgias and Protagoras would give similar answers because both turn away from earlier philosophers' fascination with knowing the hidden natures of things. They have not, however, dispensed with nature altogether. It is nature that sets conditions on human survival and makes predictable the effects of words and passions on our actions, but this is not the Nature sought by scientists or metaphysicians behind the surface of conflicting appearances. Nature for the sophists is the complex reality that marks our experience of being human and enables us to entertain reasonable expectations towards one another. Although never stable enough to be the object of Platonic knowledge, this reality is accessible to anyone's opinion through honesty and good judgment. And although the art of words is not suited to proving one opinion or another beyond doubt, it can carry us to see which are the most reasonable opinions to hold in view of what we do know. For the arena of human action and decision, where knowledge cannot obtain a grip, teaching good judgment and the art of words takes the highest practical value. This is the main teaching of the sophists. Its unexpected legacy has been the enduring challenge it has provided to philosophers.

NOTES

1 The *Helen* is in DK as 82 B11; translations are in Sprague [431] and Gagarin/Woodruff [429].

2 The main thesis of Cole [440], on which see the review by W. W. Fortenbaugh, *Gnomon* 65 (1993) 385–89.

3 Evidence for Protagoras' interest in the correctness of words: Plato, *Crat.* 391c, *Phaedrus* 267c6, *Prot.* 338e-339a; Plutarch, *Pericles* 36.3; Aristotle, *SE* 14 173b17.

4 Imitated in Plato, *Prot.* 337a-c.

5 Guthrie [17] 205.

6 Attributed by Aristotle to Protagoras (*Rhetoric* II.24 1402a23).

7 Woodruff [448]. See also Vegetti in this volume p. 278.

8 For a detailed analysis, see Long [464].

9 Bett [470], Fine [473]. For Protagoras in relation to Democritus, see Taylor in this volume p. 193.

10 For an elegant summary of the main issues in interpreting the fragment, and the scholarly consensus on these, see Mansfeld [475] 43.

11 Burnyeat [471].

12 For the second, see Burnyeat [471]; for the third, Fine [473].

13 This reconstruction, usually called the objective interpretation, is cautiously favoured by many recent scholars: Kerferd [433] 87; Mansfeld [475] 43; and Schiappa [476] 130. For a review of scholarly opinion, see Kerferd [433] 87 n.3.

14 Aristotle, *SE* 14 173b17.

15 On Nietzsche's naturalism and perspectivism, see B. Leiter, "Perspectivism in Nietzsche's Genealogy of Morals," in R. Schacht, ed., *Nietzsche, Genealogy, Morality: Essays on Nietzsche's Genealogy of Morals.* (Berkeley/Los Angeles, 1994) 334–57.

16 For example, de Romilly [435] 95–103.

17 Gorgias' *On not being* survives in two paraphrases; one, by Sextus Empiricus (*M.* VII.65-87), has evidently been adapted to serve the sceptical purposes of Gorgias' sources; the other, by the author of pseudo-Aristotle, *Melissus, Xenophanes, and Gorgias* (also defective) is preferred by many scholars and is translated in Gagarin/Woodruff [429]. Sextus' paraphrase is translated in Sprague [431] as B3.

18 Kerferd [433] 97.

19 On the interpretation of *On not being,* see Kerferd [433] 93–100; Mourelatos [465]; and Newiger [466]. Victor Caston argues, in a brilliant paper that will be part of the festschrift for A.P.D. Mourelatos that he is editing, that Gorgias' opponent in *On not being* cannot be Eleatic, and conjectures that it is Protagoras.

20 On the implications of B4 for interpreting the human-measure fragment, see Mansfeld [475].

21 Aristotle *Metaph.* IX.3 1047a4-7: "nothing is perceptible [as F] unless it is being perceived [as F]," cf. DK 29 A29. Protagoras is also said to assert that a circle and a tangent meet not at a point (as geometers say) but, presumably, as we see them – over a distance (Aristotle, *Metaph.* III.2 997b35-998a4). A possible fragment from Didymus the Blind bears on this (Woodruff [479]), as does the dialogue of Zeno and Protagoras on the millet (DK 29 A29 = Simplicius, *In phys.* 1108.18ff.). For related views, see Antiphon 6 and 37 in Gagarin/Woodruff [429].

22 Gagarin/Woodruff [429] 209.

23 Mourelatos [465].

FERNANDA DECLEVA CAIZZI

15 Protagoras and Antiphon: Sophistic debates on justice

INTRODUCTION

Justice was a major topic of debate at Athens during the period that extends from Aeschylus' *Eumenides* (456 B.C.), with its celebration of the inauguration of the court of the Areopagus, down to the trial and death of Socrates (399 B.C.), memorialized in Plato's *Apology.*[1] Historians, dramatists, orators, and philosophers provide a range of perspectives and evidence on one of the crucial issues of the age. In the earliest Greek literature human justice had been very closely linked to divine justice and power, but in the fifth century, the time of tribunals and popular assemblies, what chiefly attracts attention is justice purely in the human sphere. Questions are raised about its origin, its connection with nature and truth, its performance, the conditions that can guarantee its development, and the forces that generate its opposite – coercive power, violence, and injustice.

In order to acquire a general idea of the terms in which these issues were explored at the end of the fifth century, it is enough to read the speeches Plato puts into the mouths of Glaucon and Adeimantus at the beginning of book two of his *Republic.* These speeches provide the best introduction to our theme because they exemplify the cultural background against which Plato develops his great project in this dialogue. Before turning to details, a few words are necessary on some of the questions that emerge in the preceding book.

At the beginning of the *Republic,* Socrates accepts the invitation to enter the house of the elderly Cephalus, father of the orator Lysias and of Polemarchus. It is Cephalus who, in the course of talking to Socrates about the advantages and disadvantages of old age and wealth, introduces the theme of justice: one who is near the end of life begins to be take seriously the stories (which he has previously ignored or ridiculed) about the punishments meted out in Hades to those who have committed injustice. From what Cephalus says, a definition of justice emerges ("to tell the truth and to give back what one has received") which leaves Socrates doubtful but which Polemarchus defends, drawing support from the poet Simonides (331cd), who takes justice to be "rendering to each what is due." In the course of the ensuing discussion, Socrates also refutes this definition and its implications ("doing good to friends and harm to enemies"). This angers Thrasymachus, and after restraining himself with difficulty, he intervenes (336c), eager to propose a definition of justice he finds incontestable: "Justice is nothing else than the interest of the stronger."

When Socrates invites him to elaborate, Thrasymachus observes that justice is identical in all communities, however they are governed, and coincides with the interest of the established power, whether its constitutional form is tyranny, oligarchy, or democracy.[2] Scholars have wrestled greatly over trying to work out the precise details of Thrasymachus' position,[3] but for our purpose it is sufficient to point out that, when pressed by Socrates, he says (343cd):

> Justice and right are in reality another's good, the interest of the one who is superior and ruling but a harm accruing to the one who obeys and serves. Injustice is the opposite, and it rules over the real simpletons and just persons. Those who are ruled serve the interest of the one who is superior, and by serving him they make him happy but do nothing of the kind for themselves.

According to Thrasymachus, just and advantageous behaviour does not coincide in the same person. Whoever respects the laws and does no injury to his neighbour, that is, the just person, gives room to the one who behaves in the opposite way and always receives back less than the unjust person. This is a general rule, but its results are maximally evident in the case of tyranny. There force and power allow a single individual to pursue his own interest systematically, and this can only happen by committing injustice against other individuals who, unless they commit it in their turn, allow the one who is unjust to achieve his interest to the full. Not only are the misdeeds of the tyrant not punished, thus sanctioning the principle that the interest of the one with power coincides with justice, but they also have the further effect of giving him, thanks to his success at wrong-doing, the reputation of being the happiest of men.[4] Hence, persons who reproach injustice do so entirely out of fear that if they commit unjust actions they will suffer them in their turn. An individual's just behaviour does not coincide with his own interest and therefore does not make him happy, but it guarantees the interest and happiness of his neighbours because it does not expose them to the risk of undergoing injustice. This holds true both in interpersonal relations and particularly in the relations between subject and government, because power guarantees impunity or establishes laws that are useful to those in power.

In his response to Thrasymachus Socrates declares he does not believe:

> That injustice is more advantageous than justice, not even if it allows and does not prevent itself from doing what it wants to do. Let us imagine... someone who is unjust, and let him have the capability of doing injustice either by escaping notice or by recourse to open conflict. Even so, I at least am not convinced that his situation is more advantageous than that of justice; and that is not perhaps only my reaction but also one shared by someone else among us. (345a)

Those who do not believe that injustice is better than justice certainly include Glaucon, who soon maintains (347e) that he finds the just man's life more advantageous than the life of one who is unjust. But this statement is ambiguous and needs further clarification: it could be accepted by someone who holds that, while the advantageous and the good do not coincide completely, justice though not a good is the lesser evil, and useful solely because it avoids greater evils. Here we encounter a widely accepted position that was, of course, the exact opposite of Socrates' convictions. Glaucon repeats his point at the beginning of the next book when he expresses the wish to hear Socrates prove, once and for all, what no one has done hitherto, that justice is a good in itself for its possessor, irrespective of its consequences or whatever advantages it may produce. Only thus will it be possible to dispel the ambiguity embedded in the claim that the life of the just man is more advantageous than that of the unjust and to show that being just *is* good and coincides with one's interest. There is a need, then, to explain the current opinions on the origin and nature of justice (cf. 358a3-4; 358c; 358e-359b) in order to persuade Socrates to discuss the issue in a full and proper way.

As I have already mentioned, Glaucon's discourse (358e-362c) and the one by Adeimantus that follows it (362c-367a) provide a most suitable introduction to the theme of this chapter. The two brothers do not refer to any thinker by name, and what they say is certainly Plato's invention; but any reader familiar with Athenian life in the fifth century and with sophistic discussions cannot fail to take Plato to be evoking familiar arguments, even if those actually advanced (of which we have little direct evidence) were not formulated in terms so explicit and so brutally clear. Plato evidently alludes to theories of justice elaborated by persons who were intellectually gifted and culturally influential,[5] and also to the common opinion reflected in or conditioning the behaviour of citizens in their daily lives, thereby providing confirmation for the theories themselves.

The main lines of Glaucon's position, which is presented as a eulogy of injustice, are as follows. Speaking absolutely, or rather (to use the contemporary language), speaking with reference to "nature" (*physis*), to do injustice is something good (*agathon*), whereas to suffer it is something bad (*kakon*), in the sense that the first action is advantageous, the second disadvantageous. However, since the disadvantages that result from suffering injustice outweigh the advantages that accrue from doing it, those who are not in a position to do injustice *and* avoid suffering it find it profitable to make an agreement with one another not to do injustice. This is why human beings began to set up laws and make compacts. The name of legality and justice (*nomimon kai dikaion*) was given to law, which thus appears as a compromise between what is best (to do injustice without suffering the consequences) and what is worst (to suffer it without the possibility of retaliation). It follows that one who practises justice does it under constraint, to avoid a greater evil, and not voluntarily, as would be the case if justice were a good in itself.

Being just, as thus construed, can certainly be called advantageous, but it is so solely because of the agreement that prevents one from suffering injustice in one's turn. Under this conception justice turns out to be a second-best advantage. In reality, nature impels people to pursue self-aggrandizement (*pleonexia*) as their good, while law together with force (*bia*) induces them to respect equality (359c5-6).

This means that as soon as conditions are favourable, nature regains the upper hand over the rules forcibly imposed by law, and that whoever can commit injustice with impunity does so. People think that, from their private and personal perspective, being unjust benefits them far more than being just (360d) – so much so, that if someone who could do injustice did not do so he would be regarded as insane (acting contrary to his true nature and real advantage) even though he would be insincerely praised by those who are afraid of having injustice done to them.

If we took the lives of two men, one completely and truly just and the other completely and truly unjust, and gave the former the semblance or reputation of being completely unjust and the latter the opposite, the just man's life would be generally regarded as the paradigm of unhappiness and the unjust man's the opposite. Justice, then, pertains to the sphere of *doxa*, appearance and opinion, injustice to that of truth and reality (*alêtheia*, 362a). Injustice, personal advantage, and happiness are strictly linked, according to this view.

Adeimantus' discourse, though it maintains the same perspective as Glaucon's, is presented as a eulogy of justice, albeit with the aim of showing that what counts is its *appearance* (365b). To the objection that it is difficult to escape detection from committing injustice, various expedients are available: in regard to human sanctions, people can have recourse to secret clubs, and to rhetoricians who teach the art of persuading juries of one's innocence; as for the divine, one can suppose that there are no gods, or that they take no interest in human affairs, or that, if they do, they can be easily placated.[6]

To strengthen his case that human nature is inclined to injustice, Glaucon inserts in his speech the famous story of Gyges' ring. This enabled its possessor, a simple shepherd, to make himself invisible and so seize power by killing the king and becoming the founder of the dynasty of Croesus of Lydia (*Rep.* II 359c-360b). As is well known, Plato takes over a story told by Herodotus (I.8-13). In this latter account the wife of King Candaules forces Gyges to kill her husband and to take his place in order to punish Candaules for making Gyges look upon her extraordinary beauty. Herodotus' narrative is designed to explain how Gyges came to acquire power, but it is noteworthy that the historian does not connect this event with the murder of the king.[7] According to Herodotus, Gyges initially resisted the king's wish but was forced to submit through fear of suffering something worse (I.9.1). Then, placed by the queen in a position where he had to choose between killing or being killed, he chose killing. Herodotus emphasizes this point twice (I.11.4; 12.1), but he also insists that Gyges had no real choice; this is the fundamental difference between his version and the one told by Glaucon. The choice appears forced and inevitable because the alternatives are extreme – his life or his death. The Gyges of Herodotus is not motivated by sexual desire or by a natural lust for power or by a calculation of his future advantage. There are more differences, then, than similarities between the two stories.

To clarify the point, let us imagine that Herodotus' Gyges had had a ring that made its wearer invisible. Given the way this story is told, it is reasonable to suppose that Gyges would have used his ring to enable him to flee, thereby avoiding transgression of his people's laws (I.10.3). Glaucon's Gyges instead uses the ring as his means of killing with impunity, and so, doing what he really wants to do with no risk. The point of this story is to show that any human being, in virtue of being human, would act similarly in analogous circumstances. In book ten of the *Republic* (612b), we find explicit confirmation of what every reader of Plato knows well: for the Platonic Socrates, the ring, as a symbol of impunity, has no value and no function. If Socrates had found himself in the situation of Herodotus' Gyges, he would have unhesitatingly chosen suicide rather than committing injustice. We have only to think of Socrates' discussions with Polus and Callicles in the *Gorgias*, or his refutation of the proposal in the *Crito* that he should save himself from unjust condemnation by violating the laws.

The profound differences between the two Gyges stories enable us to focus on the principal point at issue in discussions of justice during the second half of the fifth century – the conception of human nature that is presupposed. I should like to suggest that one position, true to the spirit of Herodotus' account, is in essence the thesis of Protagoras, whereas the version narrated by Glaucon is very close to the thesis of Antiphon.

PROTAGORAS ON JUSTICE

On the basis of Protagoras' dates and what Plato says about him, we may reasonably suppose that he was the first thinker to deal extensively and authoritatively with the question of justice. Yet, it is difficult to ascertain in what work or works and in what form he treated the topic. The attribution to Protagoras of a work called *Truth* is based on a hint in Plato (*Tht.* 161c). On the evidence of Sextus Empiricus (*M.* VII.60), the same work was given the subtitle, *Overthrowing arguments (Kataballontes logoi)*, but strangely enough, neither title is found in the catalogue of Protagoras' works (D.L. IX.55). This is all the more surprising because the one thing we know about this work for certain is that it opened with the celebrated sentence: "Man is the measure of all things, of the things that are that they are, and of the things that are not that they are not." (DK 80 B1). Possibly Protagoras' so called *Truth* was one of the arguments contained in his two books of *Opposing arguments* (*Antilogiai*, D.L. IX.55), and the subtitle mentioned by Sextus referred to this collection.

This difficult question has some importance for our topic because we are told that, according to the Peripatetic Aristoxenus, "virtually all of the *Republic* [i.e., Plato's work] was written in Protagoras' *Antilogika*" (D.L. III.37).[8] Although this testimony is obviously polemical and of dubious historical value, it at least proves that Protagoras did treat the problem of justice at some length, even though we cannot be certain of his doing so in the work Plato calls *Truth*.

As regards Antiphon, we happen to know rather more about his work *On truth*. The text was still being read and copied in the third century of our era. It was in at least two books and was cited by lexicographers as the work of Antiphon of Rhamnus.[9] A number of significant fragments dealing with justice are preserved on papyri from Oxyrhynchus.[10]

It is striking that the two sophists' works share a common title, and this coincidence, together with what we know from other contemporary literature, makes it plausible to regard them as the exponents of two radically different views on human nature and the role of justice, elaborated probably within a decade of one another.

Protagoras reflects the political and cultural climate of the middle of the fifth century when, in the aftermath of the Persian wars, the Athenians were consolidating their democratic regime.[11] Antiphon is the most notable representative of a critique of law (*nomos*), which seems to reach its peak in the 420s and to reflect the events of the Peloponnesian War as described in Thucydides' history.[12] The questioning of *nomos* is shown most radically through the antithesis with nature (*physis*). This perspective presupposes familiarity with the conceptual categories of philosophy (truth versus appearance) and also awareness of anthropology as transmitted to us through the earliest Hippocratic treatises and the work of Thucydides.

If we leave aside the section of the anonymous treatise *Dissoi logoi* (Twofold arguments) on justice and injustice that some have conjecturally attributed to Protagoras,[13] the best evidence of his position comes from Plato. Early on in Plato's *Protagoras*, the character so called treats the issue of justice extensively in myth and in argument. Important too is Plato's later dialogue *Theaetetus*. The dramatic date of this dialogue, the year 399, postdates the life of Protagoras; although he is not a living character in the *Theaetetus*, he is imagined to be speaking at one point (166a-168c) and his philosophy is discussed in great detail. Two features of this dialogue, which readers often forget, are relevant to our subject. First, Plato dates it just before the time when the Athenian democracy condemned Socrates to death. Secondly, the dialogue contains a so-called digression, strategically placed in the middle (172c-177b), the theme of which (and Plato emphasizes its great importance) is the contrast between justice and injustice.

In starting, as we should, with the *Protagoras*, we need to bear in mind that interpretation of Protagoras' words in that dialogue has a significant bearing on our reading of the *Theaetetus*; according to some scholars, though by no means all, the Protagorean theses in the two works are incompatible.

Invited by Socrates to prove that virtue is teachable, Protagoras starts by expounding his famous myth (320c-322d). When the time was ripe for mortal races to be generated, the gods charged Prometheus and Epimetheus with the task of organizing them and giving them their appropriate faculties (*dynameis*). Because Epimetheus bungled the distribution, by using up all the faculties on the other animals, humanity came into the world without any means of self-preservation. So Prometheus stole fire and technology from Hephaestus and Athena, and gave them to man. Yet in spite of these gifts, human beings were not in a position to survive as a species because the other animals were too strong. Their first attempts at socialization as a means of survival failed because they lacked the art of politics and also, for that reason, the art of organizing themselves militarily.

Troubled at this situation, Zeus sent Hermes to earth with the mission to distribute to all humans *aidôs* and *dikê*, "mutual respect and justice," that is, the basic principles of social life. It is this possession, rather than technology (necessary though that is as the human means of securing what animals get directly from nature), which chiefly distinguishes human beings from other creatures, and which enables them not to succumb to the law, prevailing in the animal world, that it is the strongest who survives, a law that would destroy the human race. The distribution of these capacities was accompanied by a decree from Zeus: whoever does not participate should be killed as a menace to the community.

According to this story then, *aidôs* and *dikê* are attributes common to all normal human beings. They do not represent the natural state of individuals, taken in isolation, but they are to be taken as natural to human beings in so far as man has become a social being. Wherever cohabitation exists, there these two attributes are present notwithstanding the unjust behaviour of individuals who might cause one to have doubts about this (*Prot.* 327cd.).

It is hardly a coincidence that the kernel of this myth is already present in Hesiod's famous words (*Works and Days* 274-80):

> Perses, fix these things in your mind, pay heed to justice and cease to give any thought to violence. This is the law that Zeus has drawn up for humans, that fish and beasts and birds should devour one another, for they have no justice; but to humans he has given justice (*dikê*), which is by far the best of things.

Protagoras' myth adapts Hesiod's theme to his own time. For Protagoras, law (or rather its abstract grounds, mutual respect and justice), far from conflicting with human nature, provides the only conditions under which security is guaranteed for human beings, that is, a civil society. Law in this conception coincides with utility or with what is beneficial to the human species in general. Leaving myth and turning to history, Protagoras finds his general principle articulated in the *nomoi* (standard norms or legal statutes) that every community establishes for its own advantage. Justice consists in respect for these norms. Thanks to them and the way the members of a society are inculcated accordingly from the time they are born, the individual's interest is absorbed into the collective interest, guaranteed by it and in some sense facilitated by it (*Prot.* 327b): the individual is protected as such and as a part of a group.

The tight connection between individual and group (or, to use Aristotle's language, the fact that man is a social animal) is clearly formulated by Socrates in the defence he offers to Protagoras in the *Theaetetus* (166a-168c, especially 167a-c). If a group of individuals unites its specific judgements in a communal judgement, the latter takes on the same incontrovertible status that applies to the individual's perception of anything, such as the temperature of the wind or the flavour of honey. That which appears "just" and "fine" to every community is so for as long as the community decides so. But the content of what is just and fine varies from community to community, in the same way as, with individuals, perceptions vary from one to another (cf. *Prot.* 334ab). And, as an individual's perception may not always be useful to the subject (in the case of illness, for example, the disagreeable experience of finding honey bitter may cause someone to call in a doctor), so Protagoras, by operating on the body politic (just like a doctor on a human body) can establish as just and good for each city what is useful to it. Given the premise that what is lawful and what is just coincide, Protagoras provides himself with the grounds for his educational mission, which he calls "the art of good deliberation" (*euboulia, Prot.* 318e-319a) and which is equivalent to "advantageous" deliberation. The concept presupposes a direct intervention to modify the mental state of the subject or subjects, but the individual or the group remains the instigator of its own decisions (just as each individual, whether healthy or sick, remains the measure of its own perceptions, whether they are advantageous or harmful).

In the light of all this it seems legitimate to draw two conclusions: first, for Protagoras the community's decision – or what the community holds valid – coincides with what is just, and injustice therefore is violating the community's *nomoi.* Second, the content of the individual's perception and thought is generated by the peculiar connection between himself and things, and he is the measure of things because no one else can replace his perception and experience of reality; similarly, the connection between the set of *nomoi* (that which appears in common) and the group that produces them as such is incontrovertible. Yet, as the individual's state can be damaged and generate a condition needing medical treatment, so the body politic can generate a damaging system of law or justice and require the "wise man's" intervention, with his knowledge of how to restore the unity temporarily broken between what is legal or just and what is advantageous.

Thus the relationship between the group and what is legal, just, and advantageous is directly analogous to the individual's relation to things. The group is the measure of what is just and unjust, and the content of these varies from people to people in the same way as each individual's experience *may contrast* with that of any other.

We can see how, then, in the eyes of Protagoras a democratic constitution could represent the political system in which, more than any other, collective and individual interests coincide. Such a system places all individual citizens in a condition of "equality before the law" (*isonomia*).[14] That concept is expressed in the speech Herodotus gives to Otanes when he defends democracy (III.80.6), and it is most significantly paralleled in Pericles' funeral oration (*Thucydides* II.37.1-3). There Athenian culture is praised for the liberty its citizens enjoy, and also for the communal respect paid to the principles of community life. Pericles seems to imply that *dikê* and *aidôs*, which Protagoras calls "the gifts of Zeus," are supremely manifest in the behaviour of Athens' citizens, which therefore serves as a confirmation for the general validity of Protagoras' myth.

We should note, however, that Plato's Socrates in the *Theaetetus* refutes the applicability to values of the analogy between the doctor and the sophist that he offered Protagoras as a defence against his rudest critics. The sophist, he argues, is the representative of a widespread opinion (172ab), and "Even those who do not fully accept Protagoras' reasoning take some such view of wisdom," or hold in other words that, "in regard to justice and injustice, or piety and impiety, none of these exists by nature or has any reality of its own, but what appears collectively to people to be so is true at the time when it appears and for as long as it appears." In short, what is valid for a person's physical states (where to be healthy is "according to nature" and to be sick is "contrary to nature") cannot apply to values: once we enter the world of *nomos*, of convention, there is no longer anything to guarantee the connection between justice, legality, and interest (individual and collective) which Protagoras deceives himself that he can safeguard. This Platonic theme motivates the "most important discourse" (in the dialogue's so-called digression, 177c) on the difference between the public speaker and the philosopher with its antithesis between justice as practised in daily life and justice *per* *se* (175c). Plato evidently wanted to draw attention to what he saw as the inevitable results of Protagoras' relativism and educational mission; for all his good intentions, Protagoras could not prevent the community's ruin.

THUCYDIDEAN INTERVAL

Thucydides' history is the best testimony to this degenerative process. Pericles' optimistic propaganda in the funeral speech is flanked by a very disenchanted and dispassionate analysis of human nature and its motivations.[15] Here is a selection of some of the most famous passages.

In describing the dissemination of the plague at Athens, Thucydides comments on the way "lawlessness" (*anomia*) resulted from the disruption of normal life (II.53):

> No fear of god or law of man had a restraining influence. As for the gods, it seemed to be the same thing whether one worshipped them or not, when one saw the good and the bad dying indiscriminately. As for offences against human law, no one expected to live long enough to be brought to trial and punished. (tr. Rex Warner)

In the chaotic situation produced by the plague, the demands and impulses of individual nature surfaced, and thus they exposed the purely conventionalist character of the social norms on which the Athenians, in Pericles' words, prided themselves.

Thucydides makes similar points when he analyses the effects of civil war at Corcyra (III.82-83). There too the disruption of normal life caused the emergence of elementary needs and unleashed self-assertive impulses that overturned traditional values. "War," he observes, "is a stern teacher," a teacher that imposes itself with violence and especially teaches people to give free rein to the violence that nestles in each one of us.

The same pessimism about human nature is expressed by Diodotus during his debate with Cleon on the fate of Mytilene. Diodotus asserts that punishment[16] and the death penalty in particular are powerless to inhibit human nature from violating law (III.45)[17]:

> People still take risks when they feel sufficiently confident. No one has ever yet risked committing a crime which he thought he could not carry out

> successfully. The same is true of states. None has ever yet rebelled in the belief that it had insufficient resources...Cities and individuals alike, all are by nature disposed to do wrong, and there is no law that will prevent it, as is shown by the fact that men have tried every kind of punishment, constantly adding to the list, in the attempt to find greater security from criminals.

In Thucydides' account of the Peloponnesian War, the concept of equilibrium between individual and collective interest (which the democratic constitution had seemed to safeguard) comes to be increasingly seen as in a state of crisis. But the collision between interest and justice (where justice signifies the principle of resolving conflicts without recourse to violence) is revealed most harshly in Athens' external politics. The words of Cleon concerning laws and intellectuals in the Mytilene debate (III.37.3-4), and still more clearly, the famous declaration of the Athenian ambassadors to the people of Melos ten years later (V.89) repudiate the principle, endorsed by Hesiod and Protagoras, that the human species (as distinct from the animal world) possesses justice. Instead, they maintain that justice holds only between equals (i.e., between citizens or a single group) but not where the balance of power is unequal, as in foreign affairs. In this case, what applies is Hesiod's fable about the hawk and the nightingale (*Works and Days* 202): the one who is strongest wins.

ANTIPHON

The fragments of Antiphon's work *On truth* are the only words of a sophist on the topic of justice that survive in an unmediated form. Although we have no firm evidence about their date of composition, it is a fair guess that they antedate the first performance of Aristophanes' *Clouds*.[18] Given the work's antidemocratic stance and its clear hostility to contemporary culture, it could well have appeared at the end of the 430s.

"Legitimate" (*nomimon*) is the first word of the text that can be plausibly reconstructed (17.1B.I.5).[19] It suggests that Antiphon had mentioned the identification of legality/conventional norm and justice, and that his definition of justice as "not transgressing the laws/norms of the community in which one lives as a citizen" (1B.I.6-11) was the conclusion of the preceding argument, which is lost, and the premise of what follows.[20]

To grasp Antiphon's critique of justice, two points are important. First, in the surviving portions of the text, Antiphon consistently uses "justice" and "just" (*dikaiosynê*/*dikaion*) in their traditional and current sense.[21] He does not, like Callicles in Plato's *Gorgias* (483c), propose his own definition of justice – a "natural" or "true" justice – which contrasts with justice as conventionally conceived. Secondly, even if it is true that by the late fifth century *nomimos* "becomes the adjectival representative of *nomos* in the sense of 'statute'; it describes persons or acts that 'conform to the laws',"[22] there are many indications in the papyrus that Antiphon, in his use of these terms (*nomos*/*nomimon*), includes not only written laws but also the entire aggregate of a community's norms and rules, whether their violation incurs shame (*aischynê*) or actual legal penalty (*zêmia*). This expansion of the sphere of *nomos*, which lets it encroach on the domain proper to "nature," serves to emphasize the antithetical relationship between these concepts.

For Antiphon, justice does have a bearing on an individual's interests because it has to be practised, taking account of the laws, in the presence of witnesses. But in the absence of witnesses, one should follow nature. In the next step of his argument, he insists on the fact that nature's prescriptions are necessary, not conventional. Violation of them inevitably brings harm, irrespective of observation by others. What Antiphon has in mind seems to be the primary, or biological, demands of human nature. He does not deny that in *some* situations following justice could be advantageous; what he finds to be "hostile to nature" is "the *main* part of what is just according to laws" (1B.II.26-27).[23] But in fact his position appears quite radical when we take account of his emphasis on the strong contrast between laws and nature, on the role of witnesses, and on the difference between the sanctions that depend on *doxa* ("appearance"/"opinion"), which are only applicable when someone is caught, and the "necessary" and "true" sanctions of nature. Antiphon dissociates the individual's interest from obedience to law *per se* (1B.I.14-23) and, in contrast with Protagoras, he removes from justice the universal foundation (Zeus's gifts to man of *aidôs* and *dikê*) which makes it the distinctive characteristic of human nature and guarantees the coincidence of justice and utility. His position cannot fail to recall the premises of Glaucon's account of Gyges and his ring.

Numerous of Antiphon's points seem to reflect experience of Athenian social life, perceived from a position emphasizing the inadequacy of its rules to answer the individual's needs, and confirmed by evidence that stared everyone in the face. The recourse to nature, in terms of life and death, as the only criterion of advantage and disadvantage; the linkage between useful and pleasurable, on the one hand, and between harmful and painful, on the other (1B.IV.9-22); the observation that law cannot protect individuals even when they adhere to it (1B.V), and even less so when they are the innocent party; the reference to court proceedings and to persuasion's being much stronger than truth or falsehood (1B.VI-VII) – all imply a morality that is primarily egoistical and self-protective, skilful in justifying itself by pointing out the shortcomings of justice and law to give human beings security.

The second fragment of the papyrus includes a very subtle argument that can be appreciated if we presume that the pair of terms, "commit and suffer injustice" (*adikein/adikeisthai*), is strictly linked to the pair "commit and suffer harm" (*blaptein/blaptesthai*).[24] Assuming that telling the truth is regarded as just (and advantageous) for human affairs, one who so acts will not be just on the conception of justice implying that no injustice has been done where none has been suffered. "It is necessary in fact that one who testifies, even if he testifies the truth, commits injustice in a sense against another, and suffers it in turn, to the extent that he incurs hatred" (2A.I.15-22). Injustice/harm is done both to the one who is convicted by the testimony, because it stems from someone who for his part has suffered no harm from the convicted person, and to the witness, who will have to be on his guard against retaliation and threats for the rest of his life. Antiphon continues (2A.II.17-25):

> These injustices do not seem of small importance, neither the one that he suffers nor the one he commits. For it is impossible that these things are just, and that justice should be doing no injustice and not receiving injustice, but it is necessary that either one of them is just, or both are unjust.

In Antiphon's words, "doing no injustice and not receiving injustice," some scholars have wanted to find the sophist's own ideal of justice, but Antiphon has the traditional conception in mind, as is shown by Plato's Glaucon (*Rep.* II 359a), who comments on the fact that people find it useful to make a mutual agreement not to do or suffer injustice.[25] Nothing excludes Antiphon's thinking that this outcome might be welcome *per se*, but what we can be certain of is his effort to show why such an agreement has very little practical possibility and what its consequences would be. The link at the beginning of his text between "just" and "useful" (2A.I.6-7) and the antithesis at the end between "helping" and "harming" (2A.II.30-36) show that the foundation of his argument is the thesis (1B) that what counts is "utility." He contrasts justice with nature precisely because justice cannot guarantee what is beneficial and useful to the individual.

It is interesting that, starting from the premise (2A.I.3-9) that witnessing to the truth is regarded as just and *collectively* useful to human affairs, Antiphon immediately shifts his perspective to the single individual. Underlining the harmful effects of behaviour regarded as just, he shows that individual and collective utility do not coincide but are constantly in conflict. So he confirms once again his own distance from the position of Protagoras.

A point that still requires examination is the function he accords to *nomos* and the conditions under which it would be worthwhile for people to submit to certain restrictions (1B.V.25-VI.3):

> Now if those who accept such provisions gained some assistance from the laws, and those who do not do so but resist them were disadvantaged, the restriction implicit in the laws would not be unhelpful. But, as it is, it appears rather that those who do accept such provisions do not get sufficient help from legal justice.

The laws are the fruit of an agreement between people, but this agreement does not produce the results they hope for, a society not controlled by violence and *force majeure*.[26] These are not abstract and general problems; they concern the damage, suffering, and hardship of a single, concrete individual at every moment of his or her own existence. The inadequacy of *nomos* (and hence of justice consisting in legal prescriptions) arises from the fact that legal regulations scarcely ever correspond to the fundamental demands of nature, which are repressed by law. Nature is then the basic criterion for measuring pain and pleasure, utility and harm.

Reading Antiphon from a Platonic perspective, where the grounds of inferences are made explicit, we may supply him with the basis for a valid conclusion drawn from two such premisses as these: (1) Law is inadequate to anticipate and to check aggression; and (2) The individual naturally seeks what will give him pleasure and avoids what will give him pain. Antiphon's implied conclusion will be that the individual's interest and what will give him pleasure consist essentially in giving free rein to all natural desires, in taking advantage of one's neighbour, in short, in committing injustice. Thucydides has the unknown figure he calls Diodotus say that the violation of law is a natural instinct. In Antiphon's case, this does not imply that he invites anyone who can do so with impunity to rob a passerby as a way of providing himself with the means of satisfying his hedonistic instincts. Rather, we should take him to be inviting reflection on the way to live one's life with the minimum of discomfort in a cautious balance between natural demands and demands imposed by social life. His critique of *nomos* and justice is so impassioned because of its political tenor, which shows, in its contemporary allusions, what Ostwald has called "a certain upper-class bias against the Athenian democracy."[27]

From our limited evidence of Antiphon's *On truth*, we may conjecture that the fragments I have discussed were placed by him in a larger scientific context, marked by a concept of nature (and not just human nature) that we may call, with the risk of anachronism, secular and materialist.[28] Antiphon's interest in biology (broadly construed), and his treatment of human nature and human utility recall the medical tradition as well as some aspects of Thucydides.[29] This common ground is also evident in his psychological language, for instance, his use of *nous* to express the seat of the emotions, and the way he uses *gnômê* to signify both decision and the faculty of deciding. Though he attributes a directive function to *gnômê* (DK 87 B2), he probably insisted on the fact that it is operative only if one takes account of nature.[30]

For Plato, such a theory was contradictory because it attributed ontological and axiological priority to nature rather than intelligence. This error, in Plato's eyes, was the sophisticated outcome of an ignorance so great that it could be mistaken for supreme intelligence (*Laws* X 886b). Its principal flaw was its elevation of body above mind (891e), for that inversion, according to Plato, makes it impossible to save human life from injustice and unhappiness.

It is tempting to suppose that Antiphon's shrewd analysis was in Plato's mind when he wrote certain crucial passages in his dialogues. The fact that Plato never mentions him, or gives him the official space he accords to the other leading sophists, was probably a sort of *damnatio memoriae*, which is fully understandable only when

Antiphon as a personality is reconstructed on the basis of all the evidence at our disposal.[31]

In the case of Protagoras, Plato could share at least the sophist's positive assessment of justice and his attempt to give it foundations by making it a property belonging to human beings in their social setting. Plato could also sympathize with Protagoras' refusal to admit any polarization between *nomos* and *physis*, and the task he then had to undertake of making justice as a universal principle compatible with its varying local manifestations. The case of Antiphon was totally different – a speech-writer, affiliated with the oligarchical faction; an intellectually and politically disturbing personality, who refused to enter the political arena directly until the last phase of his life; and a man who liked to exploit his own intelligence without putting himself at personal risk, and who stopped short of drawing what Plato took to be the final and inevitable consequences of his own theories.[32]

Plato chose not to put Antiphon in direct confrontation with Socrates, but he attacks him and those like him, by implication, in numerous dialogues where he exposes the enormous dangers to culture and politics that a radical criticism of *nomos* could present. Protagoras, in spite of his support for the utility of justice and laws, did not know how to defend them against opponents because, according to Plato, his own thought was the outcome of the unstable ontology prevailing at the time. Antiphon's case for the weakness of law and for justice's incapacity to restrain human nature from injustice derived, so Plato thought, from an erroneously "materialist" conception of the world. In the shadow of Socrates and on wholly new foundations, Plato took up the huge task of restoring the dichotomy between *physis* and *nomos* and of making justice the greatest good for the human soul.[33]

NOTES

1 For an excellent treatment of the connections between justice and the origins of democracy, see Ostwald [121].

2 Much has been written about the possible connections between Thrasymachus' definition of justice, and the position adopted by Callicles in Plato's *Gorgias* (482c–484c). The chief difference is that Callicles grounds his views about the right to rule on the distinction between

nature (*physis*) and convention (*nomos*), whereas, for Thrasymachus, all that matters is the possession of power as such.

3 For a recent review of Thrasymachus' argument, cf. T. D. Chappell, "The virtues of Thrasymachus," *Phronesis* 38 (1993) 1–17.

4 Cf. *Gorgias* 470d–471d.

5 Cf. *Rep.* II 358b-362c and *Laws* X 881e1–2.

6 There are close parallels here to the themes developed in *Laws* X 885b-890a, especially in regard to the treatment of atheism in the later dialogue; cf. Decleva Caizzi [452].

7 In his account of how Deioces acquired power over the Medes, Herodotus calls attention to the man's just behaviour (I.96.2), using the term *dikaiosynê* in what may be its earliest attested occurrence in an absolute sense. See Havelock [442] and [100] 296–305, who has proposed that Protagoras was its inventor.

8 Diogenes Laertius' source for Aristoxenus' accusation of Plato's plagiarism was Favorinus (cf. D.L. III.57), who was active in the early decades of the second century A.D. We are in no position to know whether there was any truth to Aristoxenus' charge, but Plato was evidently very interested in Protagoras' work.

9 Recent scholars, unlike those writing at the time the papyrus was discovered, are inclined to identify Antiphon the orator and Antiphon the sophist. See Narcy [457].

10 DK 87 B44, which has been reedited by Bastianini and Decleva Caizzi [449].

11 This point is not affected by the question of Pericles' personal relationship with Protagoras; for doubts that have been raised about this, perhaps excessively, see P. A. Stadter, "Pericles among the intellectuals," *ICS* 16 (1991) 111–24.

12 See Ostwald [121] 199–290, who refers to "polarizations of the 420s," and Ostwald [458].

13 The *Dissoi logoi* (DK 90), a work of unknown origin and date, is customarily presumed to reflect sophistic thought; for a balanced account of it, see Burnyeat's article on "Dissoi Logoi" in Craig [145].

14 Cf. Herodotus III.80-82, and M. Ostwald, "Ancient Greek ideas of law," in *Dictionary of the History of Ideas*, vol. II (New York, 1973), 673–85, *Nomos and the Beginnings of Athenian Democracy* (Oxford, 1969), Ostwald [121].

15 Note Cleon's cynical words about the connection between a community's strength and the stability of its *nomoi*, irrespective of their worth; on Thucydides, cf. Farrar [96] 127–91.

16 Protagoras, by contrast, emphasizes the educative value of punishment (Plato, *Prot.* 324a-c). He also argues that a community's presumption of

the necessity of justice is so strong that anyone who truthfully admitted to being unjust would be regarded as mad (ibid. 323bc). Contrast *Rep.* II 359b, where Glaucon claims that anyone would be thought mad who had the means to commit injustice with impunity and declined to do so.

17 The speech Thucydides gives to Diodotus reflects Antiphon's thoughts on the intrinsic weakness of *nomos* as a sanction against *nature's* demands (cf. Moulton [456] and Decleva Caizzi [451]). Also relevant is the famous fragment from Critias' *Sisyphus* (DK 88 B25) to the effect that the gods are a human invention to supplement the weakness of law and extend the fear of detection, on which see p. 222 in this volume.

18 423 B.C. See Ostwald [458] 296–97.

19 I cite the text according to the edition of Bastianini and Decleva Caizzi [449] = *CPF* I.1* Antiphon I.17 (Antipho). In this edition, for 17.1 containing *POxy* 1364 + 3647, we have reversed the previous ordering of the fragments on palaeographical and contextual grounds; our 17.1A = DK 87 B44 fr.B, and our 17.1B = DK 87 B44 fr.A. Our 17.2 contains *POxy* 1797.

20 Cf. Xenophon, *Mem.* IV. 4.12-18, where Socrates, using the sophist Hippias as his interlocutor and starting from premises like Antiphon's, arrives at the very different conclusion that obedience to law is unequivocally advantageous to communities and individuals. Cf. Decleva Caizzi [450] 203–8

21 See Furley [453], who partly builds on Kerferd [454].

22 So Ostwald [121] 133.

23 I do not take this passage to attribute any general utility to justice, even though, according to a passage cited by Stobaeus (DK 87 B58) Antiphon commented on the folly of thinking that one who does injustice to his neighbour will escape reprisals.

24 On the attribution of this text to Antiphon, see Bastianini and Decleva Caizzi [449] 214–15.

25 For a review of scholarly opinion on this passage, see Bastianini and Decleva Caizzi [449] 221–22.

26 See 1B.I.28-30 where laws as "agreements" are distinguished from "natural" things.

27 Ostwald [458] 298.

28 For Plato's probable allusion to Antiphon at *Laws* X 889a-890a, cf. Decleva Caizzi [452]. His name occurs only at *Menexenus* 236a, on which cf. my remarks op. cit. 293–96.

29 Antiphon illustrates the uniformity of human nature by reference to respiration, laughter and weeping, hearing and vision, hands and feet (1A.II-III). Xenophon contrasts him as a hedonist and defender of material success with Socrates (*Mem.* I.6).

30 Cf. DK 87 B14, where the subject of the expression "deprived of its starting-point" should be *gnômê,* and not nature, as commonly assumed; cf. Decleva Caizzi [452] 304.

31 Antiphon was condemned to death for being the real planner of the oligarchic revolution of 411 B.C. Thucydides (VIII.68) describes him as a brilliant man, who made the best self-defence speech he had ever heard (for a probable fragment of this, cf. *CPF* I.1* 17.4.). Antiphon was executed, refused burial on Attic soil, and his descendants were stripped of their civic rights.

32 The anonymous speech writer, critical of philosophy, who is mentioned at the end of the *Euthydemus,* though it fits Isocrates, could also apply to Antiphon, as is well observed by A. E. Taylor, *Plato the Man and his Work* (London, 1960), 100–102.

33 See M. Ostwald, "Plato on law and nature," in H. North ed., *Interpretations of Plato, Mnemosyne* supp. 50 (1977), 41–63.

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GLENN W. MOST

16 The poetics of early Greek philosophy

INTRODUCTION: THE POETICS OF EARLY GREEK PHILOSOPHY?

For some readers, the very title of this chapter will seem a paradox or a provocation. After all, while the term "Presocratics" is modern, the concept has ancient roots;[1] and from the very beginning it has been used to distinguish philosophers who, for the most part, wrote in prose, from poets who composed in verse. Such a distinction, which establishes the largely nonphilosophical character of the early Greek poets and the largely nonpoetical character of the early Greek philosophers, may seem self-evident to us, but in fact it has not always been so. Heraclitus names Hesiod and Xenophanes, in the same breath with Pythagoras and Hecataeus (DK 22 B40); Hippias wrote a treatise paralleling the opinions of poets and philosophers (DK 86 B6); Plato does not distinguish sharply between poets and philosophers among his predecessors, and he has his Protagoras claim that ancient poets were really sophists but disguised their opinions for fear of exciting hostility (*Prot.* 316d-e). As far as we know, Aristotle was the first author to distinguish terminologically between what he called *mythologoi* and *theologoi* on the one hand and *physikoi* or *physiologoi* on the other. On his view, the former group were really storytellers, poets narrating myths about heroes and gods, and any views about the nature of the world that might be extracted from their works were incidental, obscure, and philosophically uninteresting; the latter group, beginning with Thales, were engaged in basically the same kind of investigation of the physical world as Aristotle himself was and, even though their theories were, unsurprisingly, deficient in comparison with his own, nonetheless they were philosophically serious, that is, they were worth studying, pillaging, and refuting. Only such a distinction, combined with specific views about the true nature of *poiêsis* as the telling of *mythoi*, could permit Aristotle to declare famously in the opening chapter of his *Poetics* that Homer and Empedocles have nothing in common except their meter, so that it would be right to call the one a poet and the other a *physiologos* rather than a poet (1447b17-20).

It was this distinction of Aristotle's that formed the foundation for his student Theophrastus' collection of the physical doctrines of the early Greek philosophers, and in turn Theophrastus' work went on to provide the basis upon which virtually all ancient and, ultimately, modern discussions of these thinkers have been constructed.[2] For this tradition, the difference between the early Greek poets and the early Greek philosophers is not merely one between verse and prose but also involves larger oppositions – between myth and reason, tradition and innovation, community and individual, constraint and freedom, error and truth. For that large part of the modern Western philosophical tradition that prides itself, rightly, upon having emancipated itself from what it sees as the shackles of myth and religion, the early Greek thinkers represent a crucial first step in a millennial process of enlightenment that leaves behind the seductive chimeras of poetry to move forward towards the cold, clear light of reason. How dare one impute a poetics to them?

And yet there are at least three senses in which one can usefully, indeed importantly discuss the poetics of early Greek philosophy. The first, most obvious, and perhaps least interesting sense is an *explicit*, conscious form of poetics. One of the many subjects that the early Greek thinkers thought about was poetry – indeed, considering the prestige poetry enjoyed in their society, it would have been astonishing, in fact irresponsible for them not to have done so – and their views on this subject can be considered as more or less rudimentary contributions to a particular philosophical discipline, the examination of the nature and aims of poetry, which later came to be termed "poetics."[3] In this sense, early Greek philosophy, which reflects about poetry just as it reflects about divinity or knowledge, has a poetics in much the same way as it has a theology or an epistemology. The range of explicit views about poetry that can be attributed to these thinkers is quite broad, stretching from admiration and acknowledgment through outright hostility; yet, they all share certain common themes that have continued to be important in later European poetics. Above all, the early Greek philosophers' explicit poetics often seem to express their distance from the established authorities of Greek poetry: by the very gesture of defining and demarcating what poets could hope to know or communicate, the philosophers seem to be suggesting that they themselves are exempt from such limitations. Thereby, of course, they seem to be carving out for themselves a discursive space that would be autonomous and privileged over other forms of social communication. Thus an explicit poetics can be understood to be a tactical instrument in the service of philosophical self-legitimation.

Secondly, the heritage of the earliest Greek poetry was a decisive factor in defining the parameters of the communicative situation of early Greek philosophy. Homer and Hesiod are not only important early evidence for the constraints that governed serious public discourse in archaic Greece, but they also massively influenced those constraints for many centuries in later Greek (and even non-Greek) culture. As a consequence, some of the fundamental criteria that the early Greek philosophers were obliged to try to satisfy in their reflections upon the cosmos and in their communication of these reflections to their listeners and readers inevitably bear a striking affinity to the most prominent features of the works of Homer and Hesiod. For all the undeniable novelty of many of the questions and answers of early Greek philosophy, the basic direction those questions took and the basic form of what could count as a satisfactory answer for them remained in many cases quite similar to analogous features of early Greek poetry. This similarity is not likely to be a merely casual parallel, or the result of some obscure trait of the abstract archaic Greek soul postulated by exponents of the *Zeitgeist* approach to intellectual history, but should rather be understood as a concrete measure of the extraordinary literary, educational, and cultural success of a very small number of poetic texts, those ascribed to Homer and Hesiod. The ways in which these two poets inevitably shaped the discursive parameters within which the early Greek philosophers operated may be termed an *implicit* poetics, for, however strong the influence of the poets upon the philosophers may have been, it is most likely to have been subliminal, rather than conscious. Any Greek producing public discourse in this period would inevitably have undergone that influence, and it is not likely that, in these regards, the early Greek philosophers were consciously attempting to rival the earliest Greek poets.

By contrast, the third, and even more interesting, kind of early Greek philosophical poetics is likely to have been fully conscious: the immanent poetic character of much of the work of the early Greek philosophers. Beyond the fundamental and widely shared discursive constraints just discussed, certain early Greek philosophers in particular seem to have chosen deliberately to deploy highly specific textual strategies closely associated with early Greek poetry. The most obvious example, of course, is the curious decision on the part of Xenophanes, Parmenides, and Empedocles to present their philosophical views to the world in the form of poetic meters, especially dactylic hexameters; indeed, the problem of why, even after the invention of philosophical prose, these figures returned to the more ancient form of verse, remains a central interpretative difficulty in accounts of early Greek thought. But the problem is not limited to these three. No less striking, in the present connection, is the evident care that Heraclitus took to formulate his insights in a language that borrowed from traditional forms of poetry effective means of expression in order to make them seem more plausible. We may term this third kind of poetics *immanent*, for it makes systematic use of specific poetic devices in the service of a philosophical communication. If it is a truism, proven most incontrovertibly by these four figures, that there is no ancient (or even modern) philosopher whose discursive form can safely be neglected if his thought is entirely to be understood, all the same it is particularly true in the case of the early Greek thinkers as a group that no account of their philosophy that considers only the structure of their arguments, and not also the form in which they chose to communicate those arguments to their public, can be considered fully satisfactory.

One important reason for this lies in the fact that it was only gradually that the practice of philosophy was institutionalized as a professional discipline during the history of European culture. For the most part, modern philosophers are professionals who write for other professionals. Author and audience are a clearly defined segment of society, marked off from other people both by an attitude, on the part of the larger social system, compounded of vague respect but basic indifference, and by a set of identifiable objective features: membership in publicly certified institutions and self-regulating associations; publication in certain kinds of journals and books, sold in special stores; and a well-established system of examinations, sanctions, and rewards, in which success is due largely (but never exclusively) to the satisfaction of publicly acknowledged criteria. In antiquity, it was only with the Neoplatonists of late antiquity, if at all, that such a closed system came to characterize philosophy; indeed, it was not until the fourth century B.C. that the first step in this direction was taken, with the sequential establishment of a series of competing philosophical schools in Athens. In the period considered in this volume, on the other hand, philosophy did not yet exist as a largely separate segment of social discourse, and the authors we call philosophers wrote not only for one another but also for the larger society of which they were a part. Hence it is not surprising that they had a more conscious, and perhaps more fruitful, dependence upon the basic texts of their culture (which in the case of Greek culture were poetic texts) than many modern philosophers do. To ignore this dependence, to disparage it as unphilosophical, or even just to excuse it as a regrettable form of primitive thought from which the really interesting core, the logical arguments, can be extracted and rescued, is inadvertently to acknowledge allegiance to a very recent and quite provincial notion of what philosophy is and is not, and to retroject that notion unhistorically into a discursive situation of the distant past whose participants would certainly have found such ideas very strange indeed.

Therefore, one reason to study the poetics of early Greek philosophy is to broaden our sense of what makes philosophy philosophy.

I. EXPLICIT POETICS IN EARLY GREEK PHILOSOPHY: THE QUARREL BETWEEN PHILOSOPHY AND POETRY

Throughout antiquity, and in fact until the Enlightenment, the most widespread view of Homer and Hesiod seems to have been that they were teachers, from whom one could, and should, learn not only certain heroic legends or divine myths but also patterns of conduct, models of discourse, and many specific varieties of practical knowledge – indeed, at the limit, divine sages who knew everything and could serve as the source of all human knowledge. Although Plato, in his *Ion*, portrayed Socrates thoroughly destroying the rhapsode

Ion's naive view that Homer must be a great poet precisely because he was a great doctor, prophet, and general, Ion's own view survived its annihilation by Plato and went on to be echoed for many centuries, supported as it was by the realities of an educational system in which all Greek children who learned to read anything at all in school learned to read Homer (and in which many never learned to read much if anything else).

It is to this widespread view that Xenophanes and Heraclitus are pointing when the former says: "From the beginning all have learned according to Homer" (DK 21 B10), and the latter: "Hesiod is the teacher of the most men [...]" (DK 22 B57).[4] But, as we shall see shortly, precisely these two thinkers are the ones whose surviving fragments contain the harshest direct criticisms of Homer and Hesiod that survive from early Greece. Hence they are not simply acknowledging the pedagogical privilege widely accorded to the early epic poets – let alone praising it. Instead, they are denouncing the fact that so many Greeks have simply taken over erroneous views from the ancient poets without examining them critically or thinking for themselves. Against the cultural dominance of such poets, these writers rise in protest and demand that henceforth Greece learn from – themselves. It is worth emphasizing that neither here nor elsewhere do the early Greek philosophers ever criticize the archaic Greek poets as being deficient in aesthetic beauty or rhetorical persuasiveness, but only in terms of the falsity of their content. The clear implication is that it is only because their poetry was so beguilingly beautiful that they were able hitherto to fool so many people. As we shall see later, not beauty, but truth is for them the decisive criterion of ultimate discursive success.

The quarrel of the early Greek philosophers with the traditional poets begins with Xenophanes, who asserts that "both Homer and Hesiod attributed to the gods all the things that are blameworthy and a reproach among men: stealing, committing adultery, and deceiving one another" (DK 21 B11).[5] Though the context of this fragment is lost, its tone is obviously reproachful: instead of praising the poets, for example, for depicting the gods as being powerful enough to be able to get away with activities regarded as shameful among humans (Homer's view of the gods is sometimes not much different from this), Xenophanes accuses them of committing a pejorative anthropomorphism, not only attaching human actions to the gods, but attaching the basest ones at that. Xenophanes does not explicitly say here that the poets have lied about the gods, but surely this was his meaning: for if gods do these things, then they are at a lower moral level even than most humans, and why then should we worship them? We know from other fragments that Xenophanes had developed a radically innovative theology that posited only a single, nonanthropomorphic divinity. Evidently, his critique of the epic tradition was designed to clear a space for his own views.[6] From our perspective, what counts as a god worthy of human reverence has evolved between Homer's time and genre and Xenophanes'; but from Xenophanes' perspective, the earlier view is simply wrong while his is right.

It is in Heraclitus that this quarrel reaches its bitterest extreme.[7] Heraclitus accuses Hesiod and Pythagoras, Xenophanes himself, and Hecataeus of having learned many things but not having acquired intelligence (22 B 40): elements of knowledge, single facts, even if juxtaposed with one another in the kind of vast encyclopedic constructs typical at least of certain forms of archaic Greek thought, are no substitute for the profound analytical intelligence that can recognize deep structures underlying the surface of appearances, and Heraclitus illustrates this principle, polemically and drastically, by simple reference to four very different kinds of sages.[8] Elsewhere, Heraclitus derided Homer for having failed, according to a traditional anecdote, to answer a children's riddle (DK 22 B56) and asserted, with a contemptuous pun, that Homer and Archilochus, so far from being performed by rhapsodes, should be beaten (*rapizesthai*) and thrown out of the poetic competitions (B42). Heraclitus' attacks upon Hesiod, on the other hand, are more specifically aimed, no doubt because he felt that the very nature of his poetry made him a more serious rival. Thus, the passage that says that "Hesiod is the teacher of the most men," goes on to assert, "They think that he knows the most, he who did not even know the day and the night, for they are one" (B57) – surely a serious oversight for someone who composed a poem called *Works and Days*! – while elsewhere Heraclitus was reported to have criticized Hesiod for claiming that some days are good, others bad, and thereby ignoring the fact that all days have exactly the same nature (B106). For Heraclitus, day and night, so far from being opposed to one another as irreconcilable contradictories, are in fact complementary partners in a larger, deeper, and more complex structure. For him, the laborious erudition of a Hesiod, who assigns day and night to different places in his cosmic genealogy and gathers traditional lore about lucky and unlucky days, is simply futile.

Both Xenophanes and Heraclitus seem to have directed their attention to poetry not for its own sake but to criticize authoritative doctrines in order to clear a space for their own. It was not until Democritus, later in the fifth century, that a Greek philosopher seems to have developed a theory of poetics in its own right; among the titles of lost works ascribed to him (D.L. IX.48) figure *Mousika* (The arts of the Muses), *Peri poêsios* (On poetry), and *Peri rhythmôn kai harmoniês* (On rhythms and harmony). Not that this is particularly surprising: about the same time, Greek poets and musicians began to compose prose treatises of their own about the arts they practised. Unfortunately, little is known about Democritus' poetic theories besides his emphasis upon what he called *enthousiasmos*, a temporary state of divine possession, to which anything fine that poets composed was due (DK 68 B17, 18). This theory may have been designed to mediate contemporary philosophical expectations of poetry with the traditional claims of the poets themselves concerning the source of their knowledge and abilities.[9] But its prime historical importance lies in the fact that Plato was to take it up once again in his own poetics and combine it with the view that the poets were not able to give an account of what they seemed to claim to know – thereby condemning the poets for some readers as ignorant and elevating them for others as inspired.

Thus early Greek philosophers laid the foundation for one of the most persistent polemical traditions in Western poetics, denying the poets' (implicit or explicit) claim to truthful knowledge and assigning them at most an irrational, inexplicable inspiration. But they also prepared the groundwork for the most important recuperative measure designed to protect the poets against such charges, namely allegorical interpretation.[10] Like the enemy of poetry, the allegorist believes that the only true doctrine is the one the philosopher possesses; but instead of simply recognizing that the poet's text, on its most obvious reading, is incompatible with that doctrine, the allegorist goes a step further and claims that, though the poet may seem to be saying one thing that contradicts the truth, in fact he means another thing that is entirely compatible with it. In so doing, the allegorist adopts the familiar fifth-century terminological opposition between *doxa* and *alêtheia*, "appearance" and "truth," which had been developed to deal with epistemological problems involving sensual appearance, and reapplies it to the poetic text. After all, if Homer and Hesiod already spoke of Odysseus or the Muses saying false things that seemed to be true (Homer *Od.* XIX.203, Hesiod *Theog.* 27), why cannot the allegorist simply invert and generalize the poets' own phrase and apply it to their poetry as a whole?

It was Theagenes of Rhegium, towards the end of the sixth century B.C., whom later Greek scholarship credited with having been the first person to have written about Homer (Schol. Hom. B ad *Il.* XX.67). We can get some idea of his approach from this scholium, which reports his interpretation of the Battle of the Gods. This passage of comic relief, inserted by Homer just before the climactic duel between Achilles and Hector, opposes to one another in painless conflict pairs of gods who are a delightfully self-conscious and inextricable blend of persons and abstractions. Theagenes ignores the immediate context, the evident anthropomorphism, and the delicious humor so that he can turn the scene into a wooden set of conceptual pairs opposing to one another physical abstractions like fire and water or ethical ones like prudence and imprudence; he supports his translation of gods into concepts partly by their traditional role and character, partly by etymology of their name.

It is easy to make fun of Theagenes' interpretations, yet their motivation was surely quite serious. To heal a rupture that had begun to open up within Greek culture between traditional sources of poetic authority and more recent criteria of conceptual argumentation was an ambitious goal, and Theagenes' success may be measured by the fact that allegorical interpretation continued to develop throughout this period and to become one of the basic tools of literary scholarship in and after antiquity. Anaxagoras, to be sure, who claimed that Homer's poetry was about virtue and justice (D.L. II.11), may have simply been characterizing the ethical dimension of Homer's narrative without subjecting it to a thoroughgoing allegorical interpretation; but Metrodorus of Lampsacus, who was said to have been his disciple (D.L. *loc.cit.*), certainly engaged in detailed, systematic, and rather ludicrous allegoresis, identifying for example the Homeric heroes with celestial phenomena (Achilles the sun, Helen the earth, Hector the moon) and the gods with anatomical ones (Demeter the liver, Dionysus the spleen, Apollo the bile: DK 61 B3-4).

The most extraordinary and extended early Greek allegoresis extant has only recently come to light. This is the so-called Derveni Papyrus, in which a still-unidentified author applies various techniques of allegorical interpretation to an epic theogonic poem ascribed to Orpheus in order to demonstrate that its real message is an eclectic physical cosmogony combining elements reminiscent of Anaxagoras, Diogenes of Apollonia, and other early Greek thinkers.[11] Despite the Derveni author's deployment of a sophisticated repertoire of interpretative techniques familiar elsewhere from the allegorical tradition – homonymy, synonymy, analogies from ordinary life, parallels from ancient epic, differences among dialects, and especially etymological explanations of names – what has struck most scholars has been the apparently wild capriciousness of his exegesis. Nonetheless, most interestingly, he has not only an allegorical practice but also a theory to justify it: he claims that, given the primitive times in which Orpheus lived, he chose to avoid using obscure scientific terminology when singing about scientific matters in order not to confuse his listeners; instead, he selected the most appropriate words from the language ordinary people already used. Only now had the Derveni author finally recovered the poem's intended meaning.

Before taking leave of the explicit poetics of early Greek philosophy, we should note that the fifth century also saw the development of an alternative vision of literary discourses, namely rhetoric, which tended to ignore altogether the question of their truthfulness and to focus instead upon analyzing and fortifying their effect upon the audience. In particular, such figures as Protagoras and Gorgias paid close attention to the formal devices and large-scale structure of early epic as of later poetry, perhaps in an attempt to understand by what techniques the celebrated poets had achieved such success so that they would be able to teach their students how to apply them to create persuasion in their own oratorical practice.[12] Gorgias' definition of poetry as metrical discourse (DK 82 B11), for example, provided the basis for most later ancient analyses of poetic language; while Protagoras' suggestion that an episode in *Iliad* XXI had been composed in order to divide the conflict into various phases, to provide a transition to the Battle of the Gods, and perhaps also to praise Achilles (DK 80 A30), is refreshingly sensitive to the articulations of a complex narrative and free of any moralizing condemnation of Homer's portrayal of the gods.

Such insights paved the way for important future developments – but for literary criticism, not philosophical poetics.

2. IMPLICIT POETICS IN EARLY GREEK PHILOSOPHY: THE HERITAGE OF EARLY GREEK EPIC

Like most preliterate peoples, the early Greeks presumably enjoyed a wealth of different kinds of oral poetry, which functioned in their totality as an encyclopedia of history and geography and as a repertory of accumulated knowledge about nature, the gods, and human society. But at the threshold of literacy, a few poets – the Greeks called them Homer and Hesiod – managed to devise ways of employing the new techniques of writing with such success that thenceforth most audiences wanted to hear only their works and no others. The result was that, within a period that may have been as short as a generation or two, these two poets drove their more traditional competitors from the field, consigning them eventually to almost complete oblivion. How did they manage to do this? No doubt the sheer poetic excellence of the epics attributed to Homer and Hesiod played an important role in their success. But "poetic excellence" is a notoriously slippery concept: rather than appealing to the innate genius of these authors or to ineffable qualities in their works, let us consider what specific, concrete features their poems have in common with one another, on the presumption that these shared traits will show us just what the expectations on the part of their audiences were that these two poets were better able to satisfy than their rivals.

The fundamental poetic goals that Homer and Hesiod seem to set themselves and claim, implicitly and explicitly, to attain in their epics are likely to have been identical with what most early Greek audiences expected from serious, sustained public discourse – not least because, like any great poets, Homer and Hesiod helped, by means of their works, to shape the audiences that would be able to appreciate them. These goals represent a heritage and a context of expectations that the early Greek philosophers could only have ignored at their own risk – and one that they quickly learned with considerable sophistication to exploit to their advantage.

We may summarize these poetic goals under five heads:[13]

(1) *Truthfulness*: We ourselves may justly admire the evident

imaginative originality and inventiveness of early Greek epic poetry; but, for their own part, Homer and Hesiod claim that, on the contrary, the only validation of their poetry is that it tells the truth, conforming veridically to a real past or present state of affairs. The epic Muse guarantees a superhuman knowledge of matters distant in time and space or otherwise remote from ordinary human knowledge: as Homer puts it in the opening of his catalogue of ships (*Il.* II.484-93) – an extraordinary geographical, onomastic, and numerical tour de force – most humans are obliged to imagine and invent, but the epic poet, sanctioned by his Muse, really *knows*. So too, when Odysseus praises the singing of Demodocus at the court of the Phaeacians, it is because the bard's account of the Trojan horse is so accurate (as Odysseus, who designed the horse himself, knows well) that he seems either to have been there himself or to have heard about it from someone who was (*Od.* VIII.489-91). Hesiod's Muses too inspire him so that he can sing of what will be and was and always is, and if they declare that they know how to tell lies that resemble truth or, when they wish, sing the truth (*Theog.* 26–28), their point is not that good poetry can be false, but that the understanding of most men is so limited that mortals, in contrast to the divine Muses, cannot tell the difference between truth and lies.[14] The most magnificent symbol of this epic claim are the Sirens, who by calling to Odysseus by name as he sails by already prove their claim that they know not only everything that happened at Troy but also everything else that happens upon the broad earth, and whose promise that whoever listens to their song will go home delighted and knowing more is so irresistible that those who hear them cannot tear themselves away, but end up, spellbound, starving to death (*Od.* XII.39-54, 166–200). As here, so always in the early Greek epic, poetry enchants, but no enchantment is greater than that produced by truth.

(2) *Essentiality of content*: The objects of Homer and Hesiod are not minor themes, but the largest and most important subjects available to their communities. For heroic epic, war is the supreme form of human interaction, and the Trojan war mobilized and destroyed vaster resources of men and materials than any other war in memory (Thucydides I.10.3). Homer's two epics focus upon the two complementary heroes and stories that, together, make up the essence of that subject: the one hero who prefers to die young and famous on the battlefield far from home rather than living on into an inglorious

old age, the other who achieves fame precisely for his ability to survive and for his final restoration to family and kingship; the one hero who is best of the Achaeans in strength and speed, the other in shrewdness and speech. As for Hesiod, his complex panoply of divinities and precepts focuses on the most important features of the universe he describes. On the one hand, the gods who always are, viewed not only in their systematic familial relations to one another but also and above all in terms of the development of the religious and moral structure of the universe from its earliest beginnings in strife and violence to the just and ordered reign of Zeus to which all powers are now subject; and on the other, the fundamental conditions of human existence, involving toil and anxiety, within a world which, sooner or later, punishes injustice and rewards piety to man and god, analyzed in terms both of valid precepts and admonitions and of mytho-historical explanatory models that set the lot of mankind as a whole into a larger and more intelligible framework.

(3) *Comprehensiveness of content*: Given the exigencies of oral production, it is likely that most performances of traditional oral epic in early Greece presented only relatively brief episodes, manageable excerpts from the vast repertory of heroic and divine legend which, implicitly present as tacit knowledge, bound together early Greek communities of singers and their listeners but could only rarely, if ever, be recited as a whole. Homer and Hesiod themselves, by contrast, recognized in the new technology of writing an opportunity for creating works which brought together within a single compass far more material than could ever have been presented continuously in a purely oral format. Homer still focuses upon relatively brief episodes excerpted out of the full range of the epic repertoire (Achilles' wrath, Odysseus' return), but he expands his poems' horizons by inserting material belonging to other parts of the epic tradition (the catalogue of ships, the view from the wall) and by making frequent, more or less veiled allusions to earlier and later events; moreover, the epic similes and Achilles' shield open up this tale of bloody-minded slaughter by inserting it into the larger horizon of the world of peace and daily cares. In his *Theogony*, Hesiod brought together within a single, richly complicated genealogical system as many as possible of the local divinities acknowledged in various places throughout the Greek world; then, in his *Works and Days* he went on to consider the conditions of human existence, including a large selection from

popular moral, religious, and agricultural wisdom. The result is that the works of both Homer and Hesiod, though neither comes even close to exhausting the latent repertory of oral epic knowledge, both point beyond themselves to include by implication vaster segments of that knowledge and to make a pan-Hellenic claim for more than merely local validity.[15] This is what audiences wanted to hear.

(4) *Narrative temporality*: It is perhaps not surprising that early Greek epic should demonstrate a keen interest in narrative – storytelling is as good a candidate for an anthropological universal as any. But nonetheless the refinement and ingenuity in the deployment of narrative techniques demonstrated by early Greek poetry is quite remarkable. Homer's *Iliad* and *Odyssey* use suspense, surprise, foreshadowing, flashback, interruption, and repetition with extraordinary skill and wit; the latter epic, in particular, sets up complicated parallel stories that reflect and comment upon one another, inserts smaller tales ironically within larger ones, and demonstrates a sophisticated recognition of the exigencies of various kinds of point of view. Even Hesiod narrativizes his own material as far as possible. In his *Theogony*, he temporalizes his account of the divine structure of the world by adopting the genre of theogony – fully understanding a god's quality requires knowing where he or she came from. What is more, he does not present his theological system in the form of a static catalogue but instead establishes relations of consanguinity, alliance, and hostility among his gods so that they can both enter into smaller narrative relations with one another and also form part of the larger story of the successive generations and wars of the gods and of the gradual, difficult, but finally successful establishment of Zeus' rule. In the *Works and Days*, then, Hesiod invents a myth of races of men in order to confer some of the same temporal substantiality upon human beings as well, and inserts his reflections upon justice and work within the framework of a highly dramatic story of contention between his brother and himself. Evidently, the Greeks liked a good story, and they preferred poets who could give them one.

(5) *Looseness of macroscopic form vs. precision of microscopic form*: Despite this sensitivity to the possibilities of narrative structures, early Greek epic tends to privilege local stylistic phenomena over larger formal considerations. Both of Homer's poems focus upon a single topic, named in the opening verses, Achilles' wrath and Odysseus' return; yet, the signs of large-scale formal organization

and of rigorous subordination of all parts to this one central theme are so few and subtle that many scholars have missed them altogether. Thus the *Iliad* does not stop with the end of Achilles' wrath against Agamemnon but continues with his wrath against Hector and concludes with his partial reconciliation with Priam, including along the way many episodes, military and otherwise, not fully indispensable for this theme; indeed, in some ancient copies of the poem the canonical last line was followed by the first line of another epic, which was thereby continuously linked to it. In Hesiod's epics, formal organization seems to be even more strikingly lacking: the progression of thought from section to section, and in some cases from sentence to sentence, is sometimes so hard to determine exactly that many scholars have been misled into denying that the poems have any logical coherence whatsoever. Both ancient and modern scholarship have been quite puzzled about just where his two poems ended; and even about the exact point at which the *Works and Days* began, there was some uncertainty in antiquity. But on the other hand, both poets display an extraordinary mastery of all the techniques and resources of the artificial language and complex meter of traditional Greek oral epic. Homer's and Hesiod's remarkable ability, from verse to verse, to make inventive and original use of the traditional stock of epic formulae, and to squeeze old and new words and phrases into the tight corset of the dactylic hexameter, meant that every line they composed provided the well-trained listener with just that mixture between the relief of familiarity and the tingle of surprise without which their poetry would have been either boringly predictable or unintelligibly novel.

Significantly, all five of these criteria survive their origin in early Greek poetry and go on to remain fully and centrally relevant for the early Greek philosophers:

(1) From its very beginning, Greek philosophy identifies itself as a discourse of *truthfulness*, rather than, for example, as one of beauty or persuasiveness. Among the earliest generations of Greek philosophers, to be sure – at least judging on the basis of the scanty surviving fragments – this identification seems to have been implicit rather than explicit, to have accompanied and tacitly legitimated statements about the fundamental nature of the world rather than to have been thematized and justified as such; but starting with

Xenophanes, the problem of whether, and if so how, human beings might attain the truth, moves to the forefront of the philosophers' attention, and they all proclaim that, while it is difficult or impossible for all (other) mortals to know the truth, they themselves know both this particular truth, and many other ones, without any uncertainty at all. In Xenophanes, this paradox is still somewhat attenuated. When he writes, "No man knows, or ever will know, the truth about the gods and all that I say about all things; for even if one chanced to say the complete truth, yet oneself knows it not; but seeming is wrought over all things [or men]" (DK 21 B34, cf. B35), he claims absolute truth not for his particular views about the gods and other matters, but only for the underlying principle that no man can attain absolute truth – about this principle he is quite certain.[16] After Xenophanes, such early Greek philosophers as Heraclitus, Pythagoras, and above all Parmenides and Empedocles will go on to claim that truth is the privileged domain of the philosopher, and will bequeath this prerogative to the rest of Western philosophy.

(2) The truths that the early Greek philosophers claim to know are not just any facts about the world, but the most important ones, the ones that make this world what it is. The philosophers' claim to *essentiality* seems already to be implied in the story of the Thracian servant-girl laughing at Thales when he fell into the well (Plato, *Tht.* 174a), and this is certainly the interpretation of such anecdotes about Thales that Aristotle provides (*Politics* I.11 1259a9): the philosopher chooses to neglect the affairs of this world in order to devote himself to what are in fact more serious matters. The ruling principle (*archê*) that the philosopher searches for is of such power that discovering it means understanding the essence of the world; so too the *stoicheia* are not just any elements but those essential ones without which some complex phenomenon would not be what it is. The early Greek philosophers tend to interpret essentiality in a numerically reductive sense: essential principles must be one or few to justify their privilege. Already Thales posits a single originative principle, water; it takes several generations before his successors come to realize that nature's diversity and processuality require more than one explanatory principle, and even then they keep to as few causes as possible. This is no doubt one important reason why the early Greek philosophers so often ascribe divine status to the principles they uncover, and like to apply to their presumed efficacy metaphors of

unquestioned power – controlling, directing, steering – for in so doing they emphasize that these principles are of essential importance in explaining the world.

(3) But if the early Greek philosophers like to reduce causes to the minimum possible number, at the same time they try to use them to explain the maximum possible number of effects. They aim at a *comprehensiveness* which would allow them to speak of only one thing, but to say of it that it is, controls, or produces all things. Already Anaximander says that the *apeiron* is the principle and element of all the things that are, all the heavens and the worlds in them (Simplicius, *In phys.* 24.13); Anaximenes is reported to have said "that infinite air was the principle, from which the things that are becoming, and that are, and that shall be, and gods and things divine, all come into being, and the rest from its products" (Hippolytus, *Ref.* 1.7.1). When Xenophanes claims that "what we call all things are actually one" (Plato, *Soph.* 242c-d); when Heraclitus asserts, "Listening not to me but to the Logos it is wise to agree that all things are one" (DK 22 B50); when Empedocles announces "the four roots of all things" (DK 31 B6); when Anaxagoras distinguishes Mind from all other things (DK 59 B12); or when Diogenes of Apollonia says that "air is that from which all the rest come into being" (Simplicius, *In phys.* 25.1) – to name only these – we find particularly striking formulations of the interdependence of essentiality and comprehensiveness. We emphasize the former if we concentrate upon the few causes and the latter if upon the multiple effects, but the genius of early Greek philosophy is precisely located in the connection between the two. This drive for comprehensiveness may also be why so many early Greek philosophers attempt to identify universal causes as well as to explain their workings in such special areas as cosmology, zoology, and anthropology. What Plutarch (*Adv. Col.* 1114b) says of Parmenides can be applied *mutatis mutandis* to most of the other early Greek philosophers as well:

> He has said much about the earth and about the heavens and sun and moon, and he recounts the coming into being of men; and as befits an ancient natural philosopher, who put together his own book, not pulling apart someone else's, he has left none of the important topics undiscussed. (DK 28 B10)

(4) The kind of picture of the world and its governing principles that the early Greek philosophers prefer to provide tends not to be

a description of a static system so much as a dynamic narrative of how things come into being and pass away. Their inclination towards *narrativity* is already implied by their search for an *archê*, a word that means not only a ruling principle but also a beginning or a source; for them, to know what something is one must know above all whence it comes. Hence their emphasis upon causality and upon relations of determination; hence too the temporal structures they build into their systems, so that cosmology, zoology, and anthropology tend to turn in their hands into cosmogony, zoogony, and anthropogony. Even Parmenides, who locates in a single, unchanging, perfect being the only possible object of knowledge, includes in his poem an account of mortal opinions whose closing words, "Thus according to belief these things came to be and now are, and having matured will come to an end after this in the future..." (DK 28 B19), emphasize its temporal dynamic. In the case of Empedocles, there can be no doubt concerning the baroque complexity of the narrative structure with which he articulated his vision of the cosmic cycles, however much scholars may disagree about the exact details of his theory. For all the early Greek philosophers, the world we see is a world of change, and it is rendered intelligible by being inserted into a causal narrative as itself the effect of some larger cause.

(5) It may be only, in part at least, an impression due to the fragmentary and doxographic nature of much of our evidence, but nonetheless, most of the early Greek philosophers certainly seem to have placed more emphasis upon the enunciation of single doctrines or propositions than upon the systematic elaboration of an extended line of argument in all its rigour and continuity. In other words, they seem, like the early Greek poets, to have focused their attention more upon *microscopic form* than upon *macroscopic form*. Thales seems not to have written a book, at least none was extant several centuries after his death. Instead, he was associated with isolated doctrines whose connection and meaning were already unclear in antiquity. Diogenes Laertius reports that Anaximander made a summary exposition of his own views (D.L. II.2); that is, presumably, a book circulated under his name in which, in discontinuous sections, individual doctrines were asserted without full supporting argumentation. The nature of Heraclitus' book is the object of considerable scholarly controversy, but the likeliest view is that it was a collection of aphorisms, most or all of them not connected grammatically

with one another, perhaps grouped together by subject matter. Parmenides certainly wrote a single poem divided into two parts, but the philosophical justification of the second part and the precise relation between it and the first part are much debated. Zeno is thought to have published simply a loose collection of paradoxes and individual arguments. As for Empedocles, scholars disagree vigorously on whether his "On nature" and "Purifications" were one poem or two poems or two parts of the same poem, and if they were indeed different, what the doctrinal and textual relationship between them was.[17] No doubt, better evidence might help clear up some of these obscurities. But it would be unlikely to change the fundamental impression that these philosophers devoted greater care to individual formulations than to large-scale organizational structures. For in any case their particular utterances are carefully crafted and memorably phrased. Anaximander's single extant sentence is described by Theophrastus (via Simplicius) as being expressed with "rather poetic words" (Simplicius, *In phys.* 24.13);[18] Heraclitus' paradoxical formulations have always fascinated and perplexed readers; and the last of the early Greek thinkers, Diogenes of Apollonia, began his book with a sentence in which he declared that a philosophical style should be simple but at the same time elevated (DK 64 B1).

In all these ways, the early Greek philosophers continued to work within the discursive framework that they had inherited from the earliest Greek poets, and transformed it into a set of expectations that could continue to apply not only to poetry but also to serious prose.

3. IMMANENT POETICS IN EARLY GREEK PHILOSOPHY: THE PHILOSOPHER AS POET

One of the most grievous scandals of early Greek philosophy is the fact that, even after the invention of philosophical prose, some of the greatest thinkers returned to poetry as the medium in which to publicize their philosophical message.[19] Xenophanes, Parmenides, and Empedocles wrote in the traditional meter of Greek epic poetry, and Heraclitus wrote in a prose evidently deeply shaped by various poetical techniques – at a time when prose had been refined by their predecessors as a medium for philosophy and was already being used for history, mythological genealogy, and various kinds of technical treatises.[20]

To be sure, even earlier thinkers wrote a prose not entirely devoid of poetic features. Anaximander's surviving sentence, as we saw earlier, was said by Theophrastus to have been expressed with "rather poetic words" (Simplicius, *In phys.* 24.13). So too, Anaximander's and Anaximenes' fondness for using striking and unexpected comparisons and similes in order to explain various natural phenomena is a philosophical adaptation of a love for explanatory analogies whose origin is probably to be found in the celebrated epic similes, so frequent in Homer, which explain what the audience does not know by a vividly worked out comparison to what it does know.[21] When Anaximander says that a sphere of flame formed around the air surrounding the earth, "like bark around a tree" ([Plut.] *Stromateis* 2), that the shape of the earth "is similar to the drum of a column" (Aetius III.10.2), that the sun is a circle of fire "like a chariot wheel" with a hole "like the nozzle of a bellows" (Aetius II.25.1), or when Anaximenes says that the earth lies upon the air "like a lid" (Aristotle, *De caelo* II.13 294b15), that the stars are implanted "like nails" in the sky (Aetius II.14.3), that the sun is flat "like a leaf" (Aetius II.22.1), or that the celestial bodies move around the earth "just as if a felt cap turns round our head" (Hippolytus, *Ref.* I.7.6), part of the effectiveness of the analogy derives from the surprise with which the most mundane and familiar of phenomena are suddenly revealed to have important and hitherto unimagined similarities with the most distant and puzzling ones. Such thinkers most likely learned this technique from Homer; in any case, its application provides a vividness and concreteness to their discourse that we may well wish to call poetic.

Nonetheless, with Xenophanes and the return to metrical poetry something new does come about, something that seems to cry out for explanation. Most often, scholars have connected the generic difference between prose and poetry with the geographical difference between Ionia in the East and Magna Graecia in the West, opposing what is taken to be the hard-nosed, empirical, innovative attitude of the Ionian tradition with a more conservative, mystical tendency in the West.[22] There may be something to this, but noting that Xenophanes came from Colophon, that Pythagoras was born in Samos, and that prose flourished in the West as in the East, we might wonder whether it would not be more fruitful to ask what functions the choice of meter could have been designed to serve. For example, verse's formal constraints make poetry much easier to remember and much harder to manipulate than prose. But suggesting that Xenophanes and his successors decided to write in verse because they wanted to cast their insights into a form that would not easily be forgotten or distorted does not explain why Xenophanes' predecessors, and Empedocles' successors, did not come up with the same idea. Instead, we should try to link the choice of poetic form to specific features of these thinkers' situation and thought.

For Xenophanes' choice, the decisive question is probably that of the circumstances of the diffusion of his works. He refuses that newfangled object, the book, as a medium of publication and prefers to return instead to the fundamentally oral situation of the public rhapsodic contest which pits one singer against another. He himself, as Diogenes Laertius informs us, was a rhapsode who also recited his own poems publicly (DK 21 A1), and the meters in which he composes – dactylic hexameters, elegiac couplets, iambic trimeters – are those typical of large-scale public recitation. By choosing this forum, Xenophanes assures himself a larger audience of nonspecialists and a wider (if not necessarily more lasting) conspicuousness and fame than any book, in this still not fully literate culture, could have secured him.

The *agôn*, the ritualized oral public competition, had in archaic Greece always been the scene for adjudicating the rivalry between one poetic display and another, but as Homer had become more and more canonized, the contest had come to focus upon measuring against one another not different poetic compositions but instead different performances of the same poetic compositions. By returning to this familiar discursive situation, and using it not in order to recite Homer's poetry better than another rhapsode but in order to recite new poetry that was to be better (i.e., more truthful) than Homer's own, Xenophanes maintains the form of this traditional institutional context but fills it with a new, antitraditional content. It is not as though Xenophanes were now substituting, for the very first time, truth for some other old-fashioned criterion of discursive success – after all, as we have seen, veridicality had always been a fundamental goal of the epic tradition – but rather that his is a new kind of truth, correspondence not to the legendary past of a specific contingent people, but to a fundamental and permanent structure necessarily valid for the whole world.[23] Possession of this truth gives him the confidence not only to criticize the greatest of the archaic poets, Homer and Hesiod, but also to proclaim the superiority of his own philosophical poetry about moral and political virtue on the one hand over the standard monodic fare of symposia: "Battles of the Titans and of the Giants and of the Centaurs, inventions of earlier men, or violent civil strife, in which there is nothing useful" (DK 21 B1.21-23), and on the other over epinician choral lyric's praise for "the athletic force of men or horses" (B2.11-12).

In Parmenides and Empedocles the choice of poetic form seems designed to resolve a crucial philosophical problem: given that all human beings are subject to the delusion of appearance, how can the philosopher know the truth of what he claims to know? For them, only a god could possibly be the source of a set of transcendent truths to which a mere mortal, if left to his own devices, would have had no access. But in archaic Greece, the language in which gods speak through human voices is in general that of metrical verse. Already in Homer, the bard is *theios*, divine,[24] and feels obliged, at the beginning of his poem and at critical junctures within it, to invoke the divine instances that inspire him; for no merely human being, unassisted, could possibly compose a string of perfect hexameters – as Aristotle pointed out (*Poetics* 4 1449a26-28), epic dactyls were quite foreign to the ordinary rhythms of vernacular speech. Poets continued to feel obliged to their Muse throughout antiquity (and even much later), and the doctrine of divine inspiration of poetry, which Democritus bequeathed to Plato, remains an eloquent, even if sometimes highly ironical, testimony to the viability of this view within philosophy. But poets were not the only spokesmen of divinity in ancient Greece: the gods spoke through oracles, at Delphi and elsewhere, and in this period never did so except in poetic meters, almost always the very same dactylic hexameters that characterized epic poetry.[25]

Whatever other purposes it served in archaic Greece, then, the dactylic hexameter also seems to have functioned as an unmistakable sign that the ultimate source of the text it articulated was not human but divine. If so, then it is surely significant that the only two early Greek philosophers who wrote exclusively in dactylic hexameters were at the same time the only ones who explicitly claimed that the wisdom they proclaimed to humanity was derived from a divine source.

Parmenides presents his philosophical poem as the product of divine inspiration, the result of his own mystic initiation into the truth by the benevolence of a goddess, who speaks for most of its length and whose message he cites for the rest of us.[26] Its opening narrates his journey to this goddess and his courteous and generous reception by her:

> The mares that carry me as far as my heart ever aspires sped me on, when they had brought and set me on the far-famed road of the god, which bears the man who knows over all cities. . . . And the goddess greeted me kindly, and took my right hand in hers, and addressed me with these words: "Young man, you who come to my house in the company of immortal charioteers with the mares which bear you, greetings. No ill fate has sent you to travel this road – far indeed does it lie from the steps of men – but right and justice. It is proper that you should learn all things, both the unshaken heart of the well-rounded truth, and the opinions of mortals, in which there is no true reliance. But nonetheless you shall learn these things too. . ." (DK 28 B1.1-3, 22-31)

Scholars have long debated how to understand this detailed opening scene, which seems to have been far different from the rest of the poem in its concrete, narrative, autobiographical character. They have pointed to evident borrowings from Homer and Hesiod, have searched for affinities with the initiatory language of the religious mysteries, and have attempted to work out detailed allegorical interpretations.[27] All these suggestions are plausible to some degree, but it should not be forgotten that this scene of divine instruction must not only be coherent with the contents of Parmenides' philosophy but also, in some sense, be believed by readers if they are to accept the status of truth which that philosophy claims for itself. Thus, when the goddess describes to Parmenides the choice between the only two possible paths of inquiry – "Come now, and I will tell you (and you must carry my account away with you when you have heard it) the only ways of enquiry that are to be thought of" (B2.1-2) – she is making a distinction, which no mortal could possibly make on his own, between a way of truth that no man has ever seen before and a path of error that is, strictly speaking, "an altogether indiscernible track: for you could not know what is not – that cannot be done – nor indicate it" (B2. 6-8). The words that she speaks to Parmenides he transmits to us. How could he, or we, have come to know this in any other way?

Parmenides has always been much criticized as a poet, and it must be admitted that what survives of his poem is far more striking for the profundity and acuity of his philosophical thought than for the characteristics we tend to associate with imaginative poetry. Perhaps our impression might be different if more had survived of the second part of his poem, which went on, after the metaphysical doctrines of the first part, to treat in some detail a large variety of sensible phenomena. But even in the extant sections we can see that Parmenides not only in general made novel use of the divine status associated with metrical form in order to legitimate a philosophical discourse transcending human capabilities, but also in particular exploited the linguistic and metrical possibilities of traditional epic in a creative and imaginative way so as to put into this archaic form doctrines that were quite new and foreign to it. This is especially true at the level of diction and of particular epic formulas, and of such motifs as that of the journey.[28]

If Parmenides cites the words a goddess spoke to him, Empedocles goes one step further and presents himself to us as a god, who pronounces his own divine poem to an astonished and admiring humanity. This is how his poem referred to as the "Purifications" began:

> Friends, who live in the great city of the yellow Acragas, up on the heights of the citadel, caring for good deeds, I give you greetings. An immortal god, mortal no more, I go about honoured by all, as is fitting, crowned with ribbons and fresh garlands; and by all whom I come upon as I enter their prospering towns, by men and women, I am revered. They follow me in their thousands, asking where lies the road to profit, some desiring prophecies, while others ask to hear the word of healing for every kind of illness, long transfixed by harsh pains. (DK 31 B112)[29]

To what extent Empedocles' claim that he is honoured as a god is realistic, to what extent wishful thinking, we may never know (though the former component is likely to have been larger than some modern readers might expect[30]); in any case, there is a lack of embarassment in his acknowledgment of his divinity which no parallel hitherto cited from epic or mystery cults makes less remarkable. Not only does Empedocles tell us he is a god but he also explains elsewhere why he has been temporarily exiled from the gods so that he might come to speak to us (he trusted insane Strife: B115), and he lists those highest categories of men whose return to earth leads soonest to a return to divinity: "But at the end they come among men on earth as prophets, bards, doctors and princes; and thence they arise as gods highest in honour, sharing with the other immortals their hearth and their table, without part in human sorrows or weariness" (B146-47). It is surely no coincidence that these are the various professions Empedocles seems to have thought he united in his own person.[31]

Empedocles, unlike Parmenides, seems usually to have been admired as a poet[32] and teacher of mysteries[33] – an extraordinary testimony to this ancient view is a recently rediscovered papyrus of his poetry from Panopolis in Egypt, which was folded and used to make a garland placed on the head of a dead man.[34] His reputation is no doubt due not only to his doctrines of transformation and reincarnation, but also to the skill with which he both adapted epic language (as Parmenides, within his limits, had done) and creatively transformed striking poetic devices typical of epic poetry.[35]

Two of these techniques, which Empedocles adopts but refunctionalizes in a highly original way, must be indicated at least briefly. The first technique is the repetition of whole verses.[36] In Homer this had been a necessary aid to oral composition, which reduced the complexity of the poet's task by letting him reuse the same verses for the same situations and thereby focus his creativity upon new situations. In Empedocles, on the other hand, the frequent repetition of verses, on at least one occasion explicitly signalled to the reader and justified as such (B25), serves to provide a textual analogy to the cycles of repetition within world history: Empedocles' poem not only describes such cycles, it also enacts them. The second technique is the epic simile.[37] As we have seen, this technique, which the epic tradition had used to prevent an ancient tale of war from gradually becoming remote and uninteresting to a present world of peace, had already been appropriated by earlier Greek philosophers. But Empedocles uses his quite striking and highly developed similes not only to illustrate isolated points in his doctrine that might otherwise be obscure but also to provide a parallel within his poetry for the structure of similarities, horizontal and vertical, at and among all levels of the cosmos, of whose existence and importance his philosophy is designed to convince us. The operation of four basic elements and two fundamental forces in all phenomena means that inevitably there will be patterns of correspondence and analogy throughout

Empedocles' cosmos (e.g., B17.34-35): his similes provide persuasive examples of such patterns throughout his text. In both of these regards, Empedocles does not merely write a philosophical text for which the choice of poetic meter helps to explain the source of his superhuman knowledge; what is more, his creative refunctionalization of specific poetic techniques transforms his poem into a presentation as well as an illustration of his doctrine.

This is even truer of Heraclitus, the last (though not chronologically) of the poetic philosophers to be considered here. To be sure, Heraclitus composed in prose and not in verse, but the biographical entry on him in the Byzantine encyclopedia, the *Suda*, concludes by asserting that "he wrote many things poetically" (*egrapse polla poiêtikôs*: DK 22 A1a), and this is probably to be taken not as a reference to spurious poems that might have circulated under his name but rather to the fact that the single prose book for which he was famous was marked by a variety of poetic techniques.[38] While the structure of that book is controversial, the frequent absence of connective particles in the quoted fragments is probably not due to the distortions of quotation but rather reflects faithfully the lack of connection among many or all of the sentences that went to make it up. As we saw earlier, its external organization may have been simply a collection of aphorisms, perhaps somewhat like the *Aphorisms* attributed to Hippocrates: individual memorable formulations, applicable to a variety of situations, grouped perhaps by subject matter, but each effective more on its own terms than because of its place in a chain of argumentation. Very often, what makes these utterances particularly noteworthy is a poetic structure of linguistic or conceptual paradox that attracts our attention but resists immediate understanding, thereby inviting us to reflect upon both Heraclitus' discourse and the world it illustrates.

One example may serve to elucidate this procedure: "Of the bow the name is life but the work is death" (DK 22 B48). In what sense is this true? Conceptually, a bow is used to bring death upon whatever we shoot with it, but that object's death may well serve to save our life if it is an animal that we are hunting so that we can eat it and save ourselves from starvation, or if it is an enemy on the battlefield whom we are fighting and who will doubtless kill us if we do not kill him first. Death and life are linked intextricably with one another in the process of the world: the death of one thing is another's life, viewed from a different perspective.[39] But this complex balance of interdependent opposites is true not only of the world Heraclitus' sentence describes but also of that very sentence. For the word in the fragment I have translated as "life" is *bios*, and though this word, accented on the first vowel, does indeed mean "life," accented on the second one it means "bow." Hence, depending upon how this sentence is read aloud, it will mean either "Of the bow the name is life but the work is death" (accenting *bíos*) or "Of the bow the name is bow but the work is death" (accenting *biós*). Looked at silently, the letters of the word *bios* can yield both meanings, but the moment they are pronounced (and, at least in this period, most reading was likely not to have been silent) the reader cannot help but accentuate either the one vowel or the other, thereby actualizing the one meaning or the other – and thereby inevitably reducing a complex truth to a one-sided, and hence partially erroneous, oversimplification.[40]

Heraclitus' prose, like the nature of which it speaks, loves to hide itself (B123). Aristotle complained that, without punctuation, the articulation and hence the precise meaning of Heraclitus' utterances was ambiguous (*Rhetoric* III.5 1407b14-18). But this was no doubt precisely Heraclitus' intention. For ambiguity is the constitutive feature of the world he describes, and between his own ambiguous *Logos* (discourse) and the ambiguous cosmic *Logos* (structure) to which it refers there is a relation of homology,[41] already established in the collection's opening aphorism (the very sentence Aristotle was complaining about):

> Of this *Logos* which is always men prove to be uncomprehending, both before they have heard it and when once they have heard it. For although all things happen according to this *Logos* men are like people of no experience, even when they experience such words and deeds as I explain, when I distinguish each thing according to its constitution and declare how it is; but the rest of men fail to notice what they do after they wake up just as they forget what they do when asleep. (B1)

Just what does the demonstrative adjective *toud(e)* (this) near the beginning of this sentence point to? Certainly, on the one hand it points to the underlying structure of the cosmos, according to which all things happen but which men have enormous difficulty recognizing. No less certainly, on the other hand, it points to this very book containing this aphorism together with all the others, which most men understand just as little after they have heard it as they did before.

Thus, like the oracular utterances to which Heraclitus more than once refers, his own aphorisms neither reveal their meaning straightforwardly nor conceal it altogether, but they reveal it by signs (B93,cf. B92). Despite the difference in genre, the closest parallel to this attitude is to be found in Heraclitus' somewhat younger contemporary Pindar, who also sought an obscure style in his poetry and presented himself as the expounder of the oracular mysteries of the Muses: "Prophesy, Muse, and *I* will be your interpreter" (fr. 150 Snell-Maehler). This may, indeed, have been one of the reasons that led Heraclitus to dedicate his book to Artemis and deposit it in her temple at Ephesus (D.L. IX.6) – not only, as Diogenes Laertius suggests, to keep it out of the hands of the masses who would have despised it, nor perhaps only to guarantee an authentic copy of his writings at a time when libraries and archives were quite unknown, but also to ensure by its collocation that it would always be seen to speak not just with the voice of a human being, but with the authority of a god.

4. CONCLUSION

The season in which philosophers could borrow the techniques of poets in order to authorize their utterances was splendid, but brief. Inevitably, more human modes of philosophical self-justification soon became more plausible. When Socrates brought philosophy down from heaven into the city and compelled it to speak of human matters in a human voice (Cicero, *Tusculan disputations* V.4.10), he irremediably changed the character of the discipline. Henceforth, with few exceptions, it was to speak in prose, not in poetry, and the prose it spoke was to seek to adhere to the criteria of lucidity and stringency rather than to those of suggestiveness and paradox. Plato would still make ingenious use of such poetic devices as dialogue and myth; but the expression "the ancient quarrel between philosophy and poetry" is his (*Rep.* X.607b), and from the beginning to the end of his career he remained obsessively concerned with finding adequate philosophical arguments for relegating poetry to a noncognitive and philosophically negligible status. Aristotle, as in so many other matters, was following in Plato's path and drawing out the ultimate consequences of this line of thought when he declared at the beginning of his *Poetics*, that the fact that Empedocles wrote in verse was irrelevant to deciding what kind of writer he was and that he was therefore to be considered a theorist of nature (*physiologos*) rather than a poet (1447b17-20). Thereafter, for better and for worse, it was in, and to, the prose of the world that philosophy was largely to dedicate itself.

Within the past century, to be sure, just when an ideal of scientific clarity was dominating so much of philosophy, a few thinkers have tried to enrich the palette of philosophical discourse by putting such clarity radically into question and seeking other discursive modes. Of the three most celebrated examples – Friedrich Nietzsche's vatic lucubrations and literary experiments, Ludwig Wittgenstein's paradoxical formulations and attention to language, and Martin Heidegger's deconstruction of Western metaphysics and return to the insights of poets and the earliest philosophers – Wittgenstein seems to have undergone virtually no direct influence on the part of the early Greek philosophers, but the degree to which the other two were inspired and guided by these thinkers, above all by Heraclitus, can hardly be exaggerated. Investigating this issue would no doubt contribute significantly towards a better understanding of the nature and limits of modern philosophy.

NOTES

1 On the relation between the development of the modern term "Presocratic" and the ancient sources, see E. Hoffmann, "Die Vorsokratiker in antiker Tradition," *Zeitschrift für philosophische Forschung* 1 (1946) 190–96 and G. W. Most, "Πόλεμος πάντων πατήρ. Die Vorsokratiker in der Forschung der Zwanziger Jahre," in H. Flashar, ed. *Altertumswissenschaft in den 20er Jahren* (Stuttgart, 1995) 87–114.

2 See Mansfeld in this volume, p. 23.

3 Lanata [536] provides a useful collection of much of the material, with Italian translation and commentary.

4 My translations in this chapter have been taken, with slight modifications occasionally, from KRS.

5 See Babut [525].

6 See Broadie in this volume, p. 212.

7 See Babut [526].

8 On this passage, see also in this volume Long, p. 9, and Hussey, p. 90.

9 See Delatte [532] and Murray [542].

10 See in general Buffière [529], Pépin [543].
11 See Laks and Most [537], and Most [541].
12 See Richardson [547], Most [540], and Woodruff in this volume, Chapter 14.
13 For general surveys of the poetics of archaic epic, see especially the relevant sections of Maehler [539] and Fränkel [97].
14 On the theme in archaic poetry of pessimism about human knowledge, see Lesher in this volume, p. 225.
15 See G. Nagy, *The Best of the Achaeans. Concepts of the Hero in Archaic Greek Poetry* (Baltimore, 1979).
16 On this passage, see Lesher in this volume, p. 229.
17 For recent discussion, cf. Wright [358]; Osborne [364]; Sedley [377]; and Inwood [357].
18 For the sentence, see Algra in this volume, p. 56.
19 For this section, cf. especially Snell [128] 136–52; Bernabé [527]; and Long [547] 245–53.
20 On the various attractions of prose in archaic Greece, see Humphreys [534].
21 See Riezler [548]; Kranz [535]; Snell [128] 199–204; Lloyd [108].
22 So, recently, Wöhrle [553] 176–79.
23 See Heitsch [191].
24 *Il.* XVIII.604; *Od.* I.336, IV.17, VIII.43, etc.
25 See the material collected in H. W. Parke and D. E. W. Wormell, *The Delphic Oracle*, 2 vols. (Oxford, 1956).
26 Cf. Tarán [276], for example, p. 31.
27 See for example, Bowra [528]; Deichgräber [530]; Fränkel [147] 158–73; Mansfeld [308]; Burkert [284]; Feyerabend [533]; Sassi [550].
28 See especially Mourelatos [309]; Pfeiffer [544]; Pieri [545]; and Coxon [270].
29 On this fragment, see most recently Riedweg [367], who emphasizes its affiliations with the mysteries.
30 Rösler [549] finds the claim so bizarre that he feels driven to assume that Empedocles is ironically criticizing those who adulate him excessively.
31 Wright [358] 291–92.
32 So even by Aristotle (fr.70 Rose, *Meteor.* 357a24f., *Rhetoric* III.5 1407a 34f.), despite *Poetics* 1 1447b17–20.
33 For a recent example, see Kingsley [105].
34 See Primavesi [546].
35 See Traglia [552].
36 The passages can be found in Bollack [356] vol. 3.2, p. 618, s.v. "Répétition."
37 See Snell [128] 213–18.

38 For Heraclitus' rhythmic prose, see Deichgräber [530].

39 See also his aphorism B88, cited and discussed by Hussey in this volume, p. 102.

40 For other examples of such sophisticated play with vocalized reading in archaic Greece, see Svenbro [551].

41 On the meanings of *Logos* in Heraclitus, see A. Busse, "Der Wortsinn von ΛΟΓΟΣ bei Heraklit," *RM* 75 (1926) 203–14, and Hussey in this volume, p. 91.

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This bibliography gives full references to all the modern works cited in each chapter by a number in square brackets (e.g., Barnes [14]). It also includes a wide range of further studies but does not repeat references (generally to works that fall outside the main stream of scholarship on Greek philosophy) already given in full in the book's footnotes. The bibliography has been selected on the basis of a policy that privileges standard works in any language, works written in English, and especially recent works. However, some of the best scholarship is relatively old and much of it is written in French, German, and Italian, so this policy has had no more than a guiding influence on the selection. Brief annotations are provided, sometimes in order to commend a work that will be found particularly useful, but the absence of such commendation has no negative implications.

The following headings are used:

I Introductory:
  (A) Comprehensive texts and translations
  (B) Comprehensive studies
  (C) Bibliographical resources
  (D) Sources and source criticism [ch. 2]
  (E) Intellectual and cultural context
  (F) Collections of articles

II Individual philosophers, movements, and topics:
  (A) The Milesians: Thales, Anaximander, Anaximenes. The beginnings of cosmology. [ch. 3; also chs. 1, 8, 16]
  (B) Xenophanes. [chs. 1, 3, 10, 11, 16]
  (C) Pythagoras, Philolaus and the Pythagorean tradition. [ch. 4]
  (D) Heraclitus. [ch. 5; also chs. 1, 10–12, 16]
  (E) The Eleatics: Parmenides and Melissus. [ch. 6; also chs. 7–12, 16]

(F) Zeno. [ch. 7; also chs. 6, 9]
(G) Empedocles. [ch. 8; also chs. 4, 10–13, 16]
(H) Anaxagoras. [ch. 8; also chs. 12–13, 16]
(I) The atomists: Leucippus and Democritus. [ch. 9; also chs. 10, 12–13]
(J) Diogenes of Apollonia. [chs. 10–11]
(K) The sophists: ethical and political thought. [ch. 14; also chs. 1, 15]
(L) Antiphon. [ch. 15; also ch. 9]
(M) Gorgias. [ch. 14; also ch. 16]
(N) Protagoras. [chs. 14–15; also chs. 9, 16]
(O) Rational theology. [ch. 10]
(P) Epistemology and psychology. [chs. 11–12]
(Q) Causality and medicine. [ch. 13]
(R) Philosophical poetics. [ch. 16]

JOURNAL ABBREVIATIONS

AGP	*Archiv für Geschichte der Philosophie*
AJP	*American Journal of Philology*
ANRW	*Aufstieg und Niedergang der römischen Welt*
AP	*Ancient Philosophy*
BACAP	*Boston Area Colloquium in Ancient Philosophy*
CP	*Classical Philology*
CQ	*Classical Quarterly*
GRBS	*Greek, Roman, and Byzantine Studies*
HSCP	*Harvard Studies in Classical Philology*
ICS	*Illinois Classical Studies*
JHP	*Journal of the History of Philosophy*
JHS	*Journal of Hellenic Studies*
JP	*Journal of Philosophy*
OSAP	*Oxford Studies in Ancient Philosophy*
PAS	*Proceedings of the Aristotelian Society*
PR	*Philosophical Review*
REG	*Revue des Études grecques*
RM	*Rheinisches Museum*
TAPA	*Transactions of the American Philological Association*

1 INTRODUCTORY

(A) Comprehensive texts and translations

The standard edition of the Greek material, which includes German translations of "B" fragments [see Mansfeld, ch. 2, p. 25], is

[1] Diels, H. *Die Fragmente der Vorsokratiker*, 6th ed., rev. W. Kranz, 3 vols. (Berlin, 1952; first ed. 1903).

On the poet philosophers, see also

[2] Diels, H. *Poetarum Philosophorum Fragmenta* (Berlin, 1901).

The main doxographical texts are edited and discussed in

[3] Diels, H. *Doxographi Graeci* (Berlin, 1879).

For a generous selection of the Greek texts (omitting material on the sophists), together with translation and commentary, see

[4] Kirk, G. S., J. E. Raven, and M. Schofield. *The Presocratic Philosophers*, 2nd ed. [1st ed. by Kirk and Raven 1957] (Cambridge, 1982).

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and the first three volumes of W. K. C. Guthrie's *A History of Greek Philosophy*.

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For philosophical stimulus (but not for scholarly accuracy), see

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II INDIVIDUAL PHILOSOPHERS AND MOVEMENTS

Items are cited here when they deal specifically with individual philosophers, movements, and themes of this volume's topic chapters. Many of the works listed in Part I – notably Barnes [14], Guthrie [15, 16, 17], Stokes [130] and Furley [99] – will be profitably consulted throughout.

(A) The Milesians: Thales, Anaximander, Anaximenes. The beginnings of cosmology

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(B) Xenophanes

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to which there is a good reply by

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[193] Lesher, J. H. "Xenophanes' scepticism," *Phronesis* 23 (1978) 1–21.
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(C) Pythagoras, Philolaus and the Pythagorean Tradition

Texts, translation, and commentary

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There is a monograph-length discussion in Guthrie [15]. For fresh and vigorously argued ideas about early Pythagoreans, see Kingsley [105]. Problems in assessing the evidence are well discussed by

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(D) Heraclitus

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[233] Kirk, G. S. *Heraclitus: The Cosmic Fragments*, 2nd ed. (Cambridge, 1962).

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[235] Mondolfo, R. and L. Tarán. *Eraclito – testimonianze e imitazione* (Florence, 1972).

[236] Robinson, T. M. *Heraclitus, Fragments: A Text and Translation with a Commentary* (Toronto/Buffalo/New York, 1987).

Of the chapters in standard books see especially Guthrie [15] and Hussey [13].

The following selection of studies includes a number of classic works of the nineteenth century:

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[245] Hussey, E. "Epistemology and meaning in Heraclitus," in M. Schofield and M. C. Nussbaum, eds. *Language and Logos. Studies in Ancient Greek Philosophy presented to G. E. L. Owen* (Cambridge, 1982) 33–59.

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[259] Robb, K. "*Psyche* and *Logos* in the fragments of Heraclitus: the origins of the concept of the soul," *The Monist* 69 (1983) 315–51.

[260] Schleiermacher, F. D. E. "Herakleitos der dunkle, von Ephesos, dargestellt aus den Trümmern seines Werkes und den Zeugnissen der Alten," *Museum der Alterthums-Wissenschaft* 1 (1808) 313–533.

[261] Schofield, M. "Heraclitus' theory of soul and its antecedents," in S. Everson, ed. *Companions to Ancient Thought: 2. Psychology* (Cambridge, 1991).
[262] Sider, D. "Heraclitus in the Derveni Papyrus," in Laks/Most [537] (1997) 129–148.
[263] Tsantsanoglou, K. "The first columns of the Derveni Papyrus and their religious significance," in Laks/Most [537] (1997) 93–128.
[264] Verdenius, W. J. "Der Logosbegriff bei Heraklit und Parmenides," *Phronesis* 11 (1966) 81–98.
[265] Vlastos, G. "On Heraclitus," in Furley/Allen [148] 413–29, first publ. more fully in *AJP* 76 (1955) 337–68, = Vlastos [160] 127–50.
[266] Wiggins, D. "Heraclitus' conceptions of flux, fire and material persistence," in Schofield/Nussbaum [245] (1982) 1–32.

On Cratylus and Plato's relation to Heracliteanism, see
[267] Kirk, G. S. "The problem of Cratylus," *AJP* 72 (1951) 225–53.

who is answered by
[268] Allan, D. J. "The problem of Cratylus," *AJP* 75 (1954) 271–87.
[269] Kahn, C. H. "Plato and Heraclitus," *BACAP* 1 (1986) 241–58.

(E) The Eleatics: Parmenides and Melissus

Bibliography on Parmenides is vast. Special treatments of Melissus are much fewer, but most discussions of Parmenides also make reference to Melissus, and he is particularly well studied in Barnes [14].

Texts, translations and commentaries

The best text of Parmenides, together with an excellent collection of the ancient sources, is
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[271] Diels, H. *Parmenides Lehrgedicht* (Berlin, 1897).
[272] Gallop, D. *Parmenides of Elea: A Text and Translation with an Introduction* (Toronto/Buffalo/London, 1984).
[273] Heitsch, E. *Parmenides: Die Anfänge der Ontologie, Logik und Naturwissenschaft* (Munich, 1974).
[274] Hölscher, U. *Parmenides: vom Wissen des Seiendes* (Frankfurt am Main, 1969).
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[278] Long, A. A. *Gnomon* 48 (1976) 645–50.

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[280] Austin, S. *Parmenides: Being, Bounds, and Logic* (New Haven, 1986).

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[283] Booth, N. B. "Did Melissus believe in incorporeal Being?" *AJP* 79 (1958) 61–65.

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[287] Curd, P. K. "Parmenidean monism," *Phronesis* 36 (1991) 241–64.

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[294] Furth, M. "Elements of Eleatic ontology," in Mourelatos [155] 241–70, first publ. in *JHP* 6 (1968) 111–32.

[295] Goldin, O. "Parmenides on possibility and thought," *Apeiron* 26 (1993) 19–35.

[296] Heidegger, M. "Moira (Parmenides VIII, 34–41)," in Heidegger [152] 79–101, first publ. in German in *Vorträge und Aufsätze* (Pfullingen, 1954).

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[298] Kahn, C. H. "The thesis of Parmenides," *Review of Metaphysics* 22 (1968/9) 700–724.

[299] Kahn, C. H. "Being in Parmenides and Plato," *La Parola del Passato* 43 (1988) 237–61.

and see also Kahn [104]

[300] Ketchum, R. J. "Parmenides on what there is," *Canadian Journal of Philosophy* 20, (1990) 167–90.

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[305] Long, A. A. "Parmenides on thinking Being," with commentary by S. Rosen *BACAP* 12 (1996) 125–62.

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[307] Malcolm, J. "On avoiding the void," *OSAP* 9 (1991) 75–94.

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(F) Zeno

For Zeno treated in relation to Parmenides and Melissus, see the previous section on "The Eleatics."

For text, translation and commentary see

[324] Lee, H. D. P. *Zeno of Elea* (Cambridge, 1936).

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see also

[326] Dillon, J. "New evidence on Zeno of Elea?" *AGP* 56 (1974) 127–31.

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Zeno's paradoxes have aroused enormous interest among philosophers and mathematicians. They are excellently treated in Barnes [14] 231–95. For a useful anthology and bibliography, see

[328] Salmon, W. C., ed. *Zeno's Paradoxes* (Indianapolis/New York, 1970).

In response to the hypotheses of Cornford [285] and Raven [226] about Zeno's targets, see

[329] Booth, N. B. "Were Zeno's arguments a reply to attacks upon Parmenides?" *Phronesis* 3 (1957) 1–9.

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